Chaplet

Microsoft MS-DOS Operating System Version 3.31
Microsoft MS-DOS Operating System Version 3.31
Microsoft GW-BASIC Interpreter

LA-30A LAPTOP USER'S GUIDE

CHAPLET LA-30A LAPTOP

USER'S GUIDE

Chaplet Systems Inc.

FCC Statement

Certified to comply with the limits for a Class B computing device pursuant to Subpart J of Part 15 of FCC rules. See instructions if interference to radio reception is suspected. FCC ID: GXLLA-30A.

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1. Six months:	LCD, floppy disk drive, hard disk drive, battery, power supply
2. One year:	PCB module, adapter, and carrying bag

CHAPLET LA-30A LAPTOP

USER'S GUIDE

First Edition: June 1989

Chaplet

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Federal Communications Commision (FCC) Statement

Warning:

This equipment has been certified to comply with the limit for a Class B computing device, pursuant to Subpart J of Part 15 of FCC rules. Only peripherals (computer input/output devices, terminals, printers, etc.) certified to comply with the Class B limits may be attached to this computer when operated in a residential environment. Operation with non-certified peripherals is likely to result in interference to radio and TV reception.

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio or television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception (determined by turning the equipment off and on), the user is encouraged to try to correct the interference by one or more of the following measures:

1. Reorient the receiving antenna.
2. Relocate the computer with respect to the receiver.
3. Move the computer away from the receiver.
4. Plug the computer into a different outlet so that computer and receiver are on different branch circuits.
5. If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful: "Interference Handbook". This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, Stock No. 04-000-00345-4.

The manufacturer is not responsible for any radio or TV interference caused by using other than the recommended cables or by unauthorized modifications to the equipment; it is the responsibility of the user to correct such interference.

User's Record

Record the following information concerning your Chaplet LA-30A or LA-30A/40 laptop below:

Purchaser's Name: ______________________________

Date of Purchase: ______________________________

Place of Purchase: ______________________________

Model Number: ______________________________

Serial Number: ______________________________

BIOS Réf. No: ______________________________

The model and serial numbers appear on a sticker at the rear of the laptop. The BIOS reference number appears on the bottom line of the screen during start-up.

Also, list below information about your dealer and service center should you need to contact them later.

DEALER: ______________________________

Contact Person: ______________________________

Phone number: ______________________________

Address: ______________________________

SERVICE CENTER: ______________________________

Contact Person: ______________________________

Phone number: ______________________________

Address: ______________________________

Overview of the User's Guide

Chapter 1 *Introducing the Laptop*

This chapter introduces the LA-30A laptop by identifying all its external parts, special features, and terminology.

Chapter 2 *Using the Laptop*

Turn on the laptop power and go to work. This chapter continues to introduce the laptop but in more of a hands-on and functional way.

Chapter 3 *Using the Hard Disk and MS-DOS*

As a direct continuation to "Using the Laptop", Chapter 3 guides you through every step of preparing your 20 or 40 megabyte hard disk for use. The chapter also covers many necessary basics of using MS-DOS. Graduate from here by moving on to the *MS-DOS User's Guide* and *User's Reference.*

Chapter 4 *The CMOS Setup*

Read this chapter when you're ready to run the CMOS setup. ***Do not*** press <Delete> at the following screen prompt after turning on the power unless you are prepared to run the setup and spend a little time to study this chapter.

```
Press <Del> to run SETUP
```

Chapter 5 *The NEAT Setup*

The NEAT Setup, called SETNEAT3.COM on your system diskette, is a utility for configuring the NEAT chip set on the laptop's main board. This chapter explains how to use this utility to configure your expansion memory in a number of different ways, including shadow RAM, extended memory, and EMS or expanded memory. Also, refer to this chapter for definitions of the various memory management schemes described in this chapter.

Chapter 6 *Expanding the Laptop*

"Expanding the Laptop" covers all the possible ways to expand your laptop, including installing an option board, installing expansion memory, etc. It provides clear, step-by-step instructions and numerous illustrations to make expansion as simple and quick as possible.

Chapter 7 *Solving Problems*

Check this chapter if there's an unusual problem with the laptop.

Appendix A *Specifications*

The specifications of the LA-30A and LA-30A/40 laptop computers.

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Important Safety Instructions

1. Read all of these instructions.

2. Save these instructions for later use.

3. Follow all warnings and instructions marked on the product.

4. Unplug this product from the wall outlet before cleaning. Do not use liquid or aerosol cleaners. Use a damp cloth for cleaning.

5. Do not use this product near water.

6. Do not place this product on an unstable cart, stand, or table. The product may fall, causing serious damage to the product.

7. Slots and openings in the cabinet and the back or bottom are provided for ventilation. To ensure reliable operation of the product and to protect it from overheating, these openings must not be blocked or covered. The openings should never be blocked by placing the product on a bed, sofa, rug, or other similar surface. This product should never be placed near or over a radiator or heat register. This product should not be placed in a built-in installation unless proper ventilation is provided.

8. This product should be operated from the type of power source indicated on the marketing label. If you are not sure of the type of power available, consult your dealer or local power company.

9. This product is equipped with a 3-wire grounding type plug, a plug having a third (grounding) pin. This plug will only fit into a grounding-type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the purpose of the grounding-type plug.

10. Do not allow anything to rest on the power cord. Do not locate this product where persons will walk on the cord.

11. If an extension cord is used with this product, make sure that the total of the ampere ratings on the products plugged into the extension cord do not exceed the extension cord ampere rating. Also, make sure that the total of all products plugged into the wall outlet does not exceed 15 amperes.

12. Never push objects of any kind into this product through cabinet slots as they may touch dangerous voltage points or short out parts that could result in a risk of fire or electric shock. Never spill liquid of any kind on the product.

13. Except as explained elsewhere in this manual, do not attempt to service this product yourself. Opening or removing those covers that are marked "Do Not Remove" may expose you to dangerous voltage points or other risks. Refer all servicing in those compartments to service personnel.

14. Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:

    A. When the power cord or plug is damaged or frayed.

    B. If liquid has been spilled into the product.

    C. It the product has been exposed to rain or water.

    D. If the product does not operate normally when the operating instructions are followed. Adjust only those controls that are covered by the operating instructions since improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to normal operation.

    E. If the product has been dropped or the cabinet has been damaged.

    F. If the product exhibits a distinct change in performance, indicating a need for service.

15. Use only with adapters noted in the user's guide.
16. Risk of electric shock:Disconnect power adapter before installing or removing unit.

WARNING !

Improper connection of any peripheral device to the LA-30A may cause damage to your machine. Please follow these steps when you try to contact any peripheral device to the LA-30A.

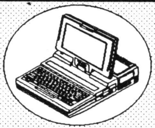
1. Make sure that power to both the LA-30A and the peripheral is turned off.
2. Use the proper cable to connect the LA-30A and the peripheral.
3. Switch on the power to the LA-30A and the peripheral.

Proper Care of the LCD Screen

1. Avoid scratching the surface of the screen. The front polariser is easily damaged.
2. For cleaning, use a cotton or other soft cloth. Wipe the surface swiftly. If still not clear, blow on the surface and wipe.
3. Water droplets must not be allowed to remain on the screen. They could cause permanent staining.
4. Before touching or handling the screen earth yourself. Electrostatic charge buildup could damage the CMOS LSIs.
5. Do not expose the screen to intense sunlight or ultra violet radiation. Avoid exposing to the Sun for long periods.
6. Do not expose the unit to extreme temperatures. Liquification or freezing of the liquid crystals could occur resulting in damage.

CHAPTER 1

Introducing the Laptop



How to Use This Manual

In this chapter we'll introduce to you the external parts of your new LA-30A or LA-30A/40 Laptop Computer. Read this chapter to familiarize yourself with the laptop components and terms, as you will need to know these in subsequent chapters. Later we'll guide you into the use of your laptop by pointing out certain things that you should or should not do when turning on the computer. For now, take a few minutes and look over Chapter 1.

If you're very experienced in personal computers, a few chapters of this manual can be skimmed, particularly chapters one through three. Take special note though of paragraphs marked *Warning* and other sections peculiar to the LA-30A. These contain important information that should not be overlooked.

Concerning Related Models

Chaplet produces three versions of the model 30 laptop computer. The LA-30A is the upgraded version of the older LA-30. It is also Chaplet's new standard laptop. If you have the LA-30 laptop, you should contact Chaplet or a local dealer for updated information, especially concerning the NEAT Setup utility, EMS, and shadow RAM. You may contact Chaplet by writing to the address listed on page iii of this manual.

The LA-30A/40 is simply Chaplet's deluxe LA-30A. Instead of a 20 megabyte hard disk as with the LA-30A, the LA-30A/40 packs a 40 megabyte hard disk drive with the same physical size and proportions as the lower capacity 20 megabyte hard disk. Beside differences in hard disk drives, all other aspects of these two laptops are the same. The only exception to this statement which, by the way, should only concern engineers or service technicians, is the difference in BIOS. Due to differences in hard drives, the BIOS of these laptops must also differ.

In this manual nearly all references are to the LA-30A. This should not concern those who own an LA-30A/40, because, though the hard disks differ physically, the two laptops and their hard disks function exactly the same. For a list of your laptop's hard disk specifications, refer to Appendix A.

Unpacking the Laptop

Now remove the laptop and its accessories from the box and packing material. Refer to the checklist below to confirm that everything has been included. If anything is missing, immediately contact your dealer.

1. LA-30A Laptop Computer
2. AC adapter
3. Power cord
4. Keyboard cable: For connecting an external keyboard
5. COM 2 cable
6. MS-DOS 3.3 high density 3.5" system diskette

7. Carrying bag
8. This *LA-30A Laptop User's Guide*
9. *MS-DOS 3.3 User's Guide* and *User's Reference* (one volume)
10. GW-BASIC 3.2 Manual

Once you've unpacked the laptop and accounted for all accessories, briefly inspect all parts for any shipping damage. Do not discard the box and packing material. Later you may need to use these materials again. Also, check the floppy disk drive for a cardboard retainer. If found, remove it. In Chapter 2 when you turn on the computer, there must not be anything in the drive except possibly a normal 3.5" floppy diskette.

Next, record your name, the date and place of purchase, and the machine model and serial numbers on page vi of this manual. The model and serial numbers appear on a sticker at the rear of the laptop. Also, record your dealer's and service center's name, phone number, and address in the same section.

Identifying Laptop Features

Now place the laptop on a desk or table where you can work with it. Press the LCD panel latch and raise the LCD panel as shown in Figure 1-1 below. Beginning with this section, we will help you to examine and become familiar with all the external parts of the laptop. Later, refer to this section if you forget the names, location, or function of any of the LA-30A's parts.

The Front of the Laptop

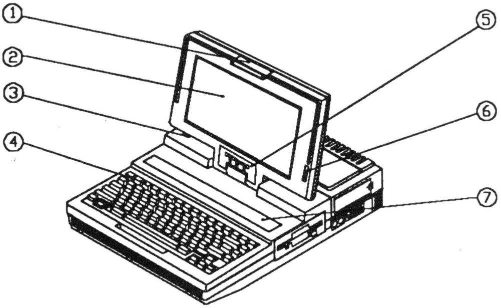


Figure 1-1. The front of the laptop with screen raised.

Refer to Figure 1-1 above to identify the following parts of the laptop:

1. **LCD Panel Latch**--for opening and closing the LCD panel.

2. **LCD Screen**--for displaying text and graphics output.

3. **Power Indicator** lights according to the condition of the power supply:

Off	System off. AC adapter disconnected.
Blinking	Battery charging. AC adapter connected.
Red	Battery low. System on with AC adapter disconnected.
Yellow	Battery voltage between low and fully charged. System on with AC adapter disconnected.
Green	Battery fully charged. AC adapter connected.

4. **Keyboard**--an input device. Use it like a typewriter to provide the laptop with character data. See the section on the keyboard in this chapter for further explanations.

5. **Indicator Panel**--contains hard disk and screen mode buttons, and LED indicators to report system status. See the section on the indicator panel in this chapter for further explanations.

6. **Contrast Adjustment Lever**--controls the contrast of the LCD.

7. **Function Key I.D. Label**--a removable plastic strip just above the function keys where function key reminders may be written.

The Right Side of the Laptop

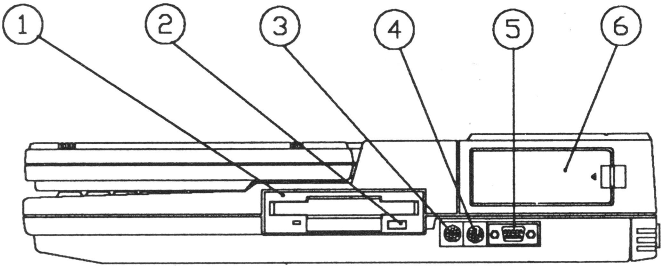


Figure 1-2. The right side of the laptop.

Refer to Figure 1-2 above to identify the following parts of the laptop:

1. The **3.5" 1.44 MB/720 KB Floppy Disk Drive** transfers data to and from a 3.5" 1.44 MB or a 720 KB floppy diskette.

2. The **Diskette Eject Button** is used to release a diskette from its drive.

3. The **External Keyboard Connector** may receive a keyboard adapter for connecting an external keyboard to the laptop.
4. The **COM 2 Serial Connector** receives a special conversion adapter supplied with the laptop for connecting with a digitizer, a modem, or other serial peripheral.
5. The **COM 1 Serial Connector** may receive an adapter for a digitizer, a modem, or other serial peripheral.
6. The **Option Board Access Panel** may be removed to expose and allow access to a user-installed option board.

The Back and Left Sides of the Laptop

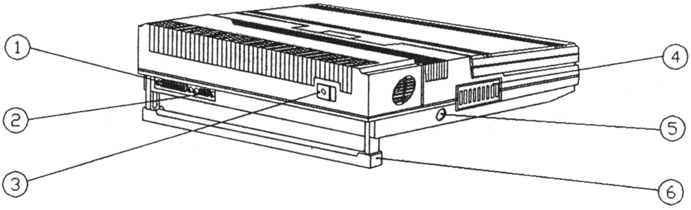


Figure 1-3. The back and left sides of the laptop.

Refer to Figure 1-3 above to identify the following parts of the laptop:

1. The **Parallel Connector** may receive an adapter for a printer or other parallel device.
2. The **External Display Connector** may receive a display adapter for connecting an external monitor to the laptop.

3. The **Power Switch** is used to turn the laptop on or off.

4. The **Hard Disk Panel** marks the location of the internal hard disk.

5. The **Power Connector** receives the AC adapter. The internal battery will charge automatically when using the AC adapter.

6. The **Carrying Handle** may be used instead of the carrying bag to tote the laptop, and may also be used to raise the rear of the laptop for a more comfortable operating position.

The Keyboard

The keys of the keyboard can be grouped into five major groups: the alphanumeric keys, the function keys, the editing keys, the numeric keypad, and other miscellaneous keys. The following five sections identify these groups and explain the function of the keys within their respective group.

Alphanumeric Keys

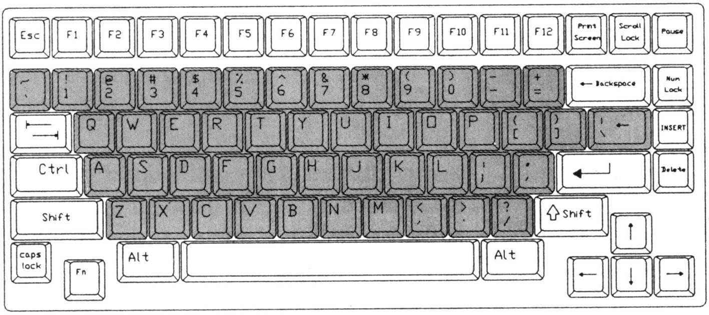

Esc F1 F2 F3 F4 F5 F6 F7 F8 F9 F10 F11 F12 Print Screen Scroll Lock Pause
~ ` ! 1 @ 2 # 3 $ 4 % 5 ^ 6 & 7 * 8 (9) 0 _ - + = Backspace Num Lock
Q W E R T Y U I O P { [}] | \ INSERT
Ctrl A S D F G H J K L : ; " ' Delete
Shift Z X C V B N M < , > . ? / Shift
caps lock Fn Alt Alt

Figure 1-4. The keyboard: Alphanumeric keys.

The Alphanumeric Keys consist of the alphabetic keys (A-Z) and the numeric keys (1-0), and other keys with special printable characters. These in general consist of the same printable characters found on most typewriters. See Figure 1-4 above.

Function Keys

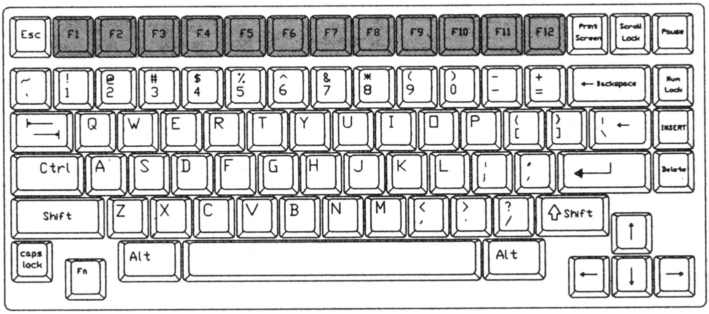

Esc
F1
F2
F3
F4
F5
F6
F7
F8
F9
F10
F11
F12
Print Screen
Scroll Lock
Pause
Backspace
Num Lock
INSERT
Delete
Ctrl
Shift
Shift
caps lock
Fn
Alt
Alt

Figure 1-5. The keyboard: Function keys.

The Function Keys labeled F1 through F12 in Figure 1-5 above are used to perform special functions that differ from one program to another. Refer to the appropriate software's user's guide for function key definitions .

Editing Keys

Editing keys' functions usually differ slightly with different software. Refer to the appropriate software manual for detailed information on these editing keys. See Figure 1-6 below for the placement of the editing keys on the keyboard.

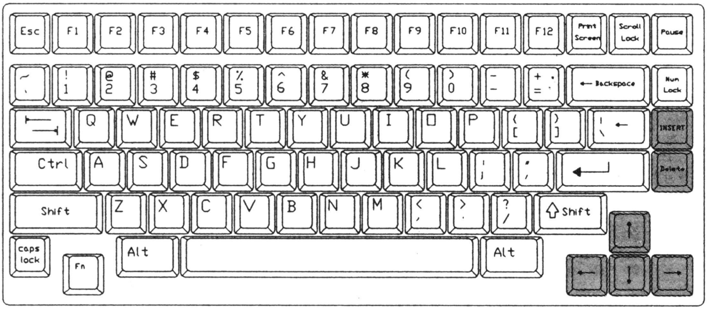

Esc
F1
F2
F3
F4
F5
F6
F7
F8
F9
F10
F11
F12
Print Screen
Scroll Lock
Pause
~ `
! 1
@ 2
# 3
$ 4
% 5
^ 6
& 7
* 8
(9
) 0
_ -
+ =
Backspace
Num Lock
Q
W
E
R
T
Y
U
I
O
P
{ [
}]
| \
INSERT
Ctrl
A
S
D
F
G
H
J
K
L
: ;
" '
Delete
Shift
Z
X
C
V
B
N
M
< ,
> .
? /
Shift
caps lock
Fn
Alt
Alt

Figure 1-6. The keyboard: Editing keys.

1. The **<Insert>** key is used to insert characters to the position indicated by the cursor. Press the <Insert> key again to deactivate the insert mode.

2. The **<Delete>** key is used to delete the character(s) marked by the cursor.

3. **Cursor (or Arrow) Keys** marked with four different arrows, are used to move the cursor from one place on the screen to another. In this manual, these keys are referred to as <Up>, <Down>, <Left>, and <Right>.

4. **<Home>**, **<End>**, **<PgUp>**, and **<PgDn>** are all accessed by first pressing the <Fn> key and differ slightly in function from one program to another.

Numeric Keypad

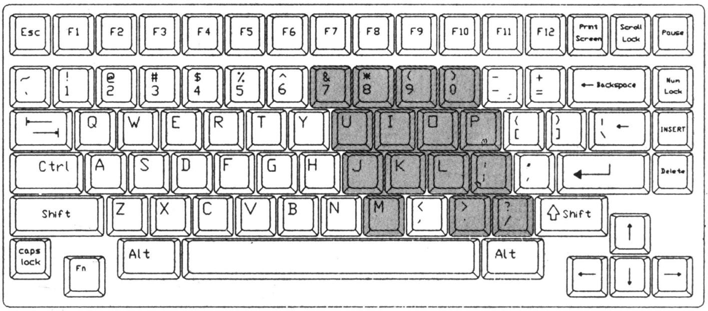

Esc
F1
F2
F3
F4
F5
F6
F7
F8
F9
F10
F11
F12
Print Screen
Scroll Lock
Pause
Backspace
Num Lock
Q
W
E
R
T
Y
U
I
O
P
INSERT
Ctrl
A
S
D
F
G
H
J
K
L
Delete
Shift
Z
X
C
V
B
N
M
Shift
caps lock
Fn
Alt
Alt

Figure 1-7. The keyboard: The numeric keypad.

The Numeric Keypad shown in Figure 1-7 above is activated by pressing the <Num Lock> key. When the numeric keypad is in effect, you cannot use the characters marked on the top face of the numeric keypad keys. To use those characters you must first deactivate the numeric keypad by pressing <Num Lock> again. An LED on the indicator panel will light when the keypad is in affect.

Miscellaneous Keys

Miscellaneous keys' functions usually differ slightly in different software. Refer to the appropriate software's manual for detailed information on these keys.

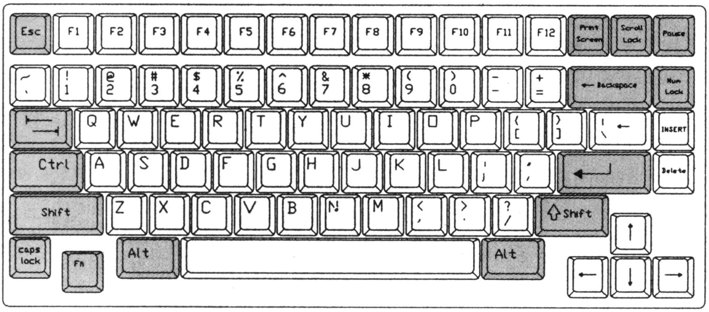

Esc
F1
F2
F3
F4
F5
F6
F7
F8
F9
F10
F11
F12
Print Screen
Scroll Lock
Pause
Backspace
Num Lock
Q W E R T Y U I O P
INSERT
Ctrl
A S D F G H J K L
Delete
Shift
Z X C V B N M
Shift
Caps lock
Fn
Alt
Alt

Figure 1-8. The keyboard: Miscellaneous keys.

Refer to Figure 1-8 above to identify the following parts of the keyboard:

1. The **<Esc> (Escape) Key** is used for special purposes. Its function depends on the software being used.

2. The **<Tab> Key** located just above the <Ctrl> key is used to move between tab stops.

3. The **<Ctrl> and <Alt> Keys** are used in conjunction with other keys for special functions. Note that there are two <Alt> keys on the left and right sides of the keyboard.

4. The **<Shift> Key** is pressed with any alphanumeric key to produce the uppermost character on the face of a key. It is also used with the alphabetic keys to produce uppercase letters.

5. The **<Caps Lock> Key** locks the alphabetic keys into the uppercase mode. It does not do the same for the numeric keys. To use the special characters above the numerals on the numeric keys, you must manually hold down the <Shift> key each time.

NOTE:

<Shift> and <Caps Lock> are both switches; that is, they reverse whatever is presently in affect. For example, if <Caps Lock> is on, pressing <Shift> with an alphabetic key will produce a lower case letter, not an upper case one. Pressing <Shift> and an alphabetic key with <Caps Lock> off, or activating <Caps Lock> and pressing an alphabetic key without using <Shift> will both produce an upper case letter.

6. The **<Fn> Key** is used to invoke the function in black identified on the front face of some keys. For example, press this key and the up-arrow cursor key to invoke Page Up function (Press <Fn> and <PgUp> simultaneously).

7. The **<Print Screen> Key** is used to send the screen contents to a printer. See "Keyboard Functions" in Chapter 3.

8. The **<Scroll Lock> Key** is used in many programs with the cursor keys to view a text file.

9. The **<Pause> Key** is used to freeze the contents of the screen with DOS. Strike any other key to resume scrolling on the screen.

10. The **<Backspace> Key** is used to backspace over (erase) what has already been typed.

11. The **<Num Lock> Key** is used to invoke the numeric keypad, the set of alphanumeric keys marked with blue numbers or characters on their front face.

12. The **<Enter> or <Return> Key** is the long key on the right used to enter a line of information into the computer.

13. The **<Space bar>** is the long bar on the bottom of the keyboard.

The Indicator Panel

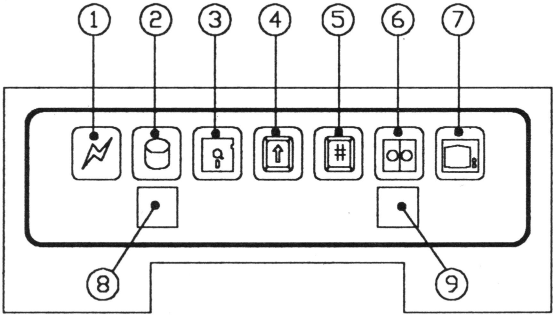


Figure 1-9. The indicator panel.

Refer to Figure 1-9 above to identify the following parts of the indicator panel:

1. The **Turbo Indicator** lights when the laptop's CPU operates at high speed, 12 Mhz. When the LED is off, the laptop operates at 6 Mhz.

2. The **HD (Hard Disk) Access Indicator** lights when the laptop is reading or writing information to the hard disk.

3. The **FDD (Floppy Disk Drive) Indicator** lights when the floppy disk drive is active (spinning).

4. The **Caps Lock Indicator** lights when the alphabetic keys are set to upper case.

5. The **Num Lock Indicator** lights when selected alphabetic keys are set to function as a numeric keypad.

6. The **Screen Mode Indicator** lights when the screen is in normal video mode; inverse video mode when not lit.

7. The **CRT Indicator** lights when the laptop is in the screen mode for an external monitor. See "Setting the Screen Mode" in Chapter 6 for different screen modes available.

8. The **HD Button** controls power to the internal hard disk drive. Press it when the laptop is on to enable the hard disk.

   The **HD Power Indicator** within the HD Button lights when hard disk power is on, when the HD Button is depressed. The button's purpose is to allow for power conservation when operating the laptop from the internal rechargeable battery.

9. The **Screen Mode Button** is used to toggle the display between normal and inverse video.

The AC Adapter

The AC adapter converts high level AC voltage from a wall outlet to a much lower level of DC voltage that is appropriate for the laptop. The adapter's input voltage can range anywhere from 90 to 260 volts, covering the standard AC voltages available in almost every country. For details on the AC adapter's performance, see Appendix A, "Specifications", near the end of this manual.

When the adapter with its accompanying power cord is connected to the laptop and an AC wall outlet, the laptop's internal battery will automatically recharge. See "Charging the Battery" in Chapter 2 for more information on the charging status of the battery. See Figure 1-10 below for an illustration of the AC adapter and power cord.

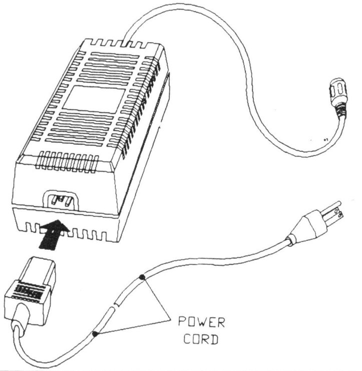


Figure 1-10. The AC adapter and power cord.

The Floppy Diskette

The laptop uses a 3.5" disk drive to transfer data to and from either of two kinds of 3.5" diskettes: high-density (HD) floppy diskettes capable of storing 1.44 megabytes of information; or double density (DD) floppy diskettes capable of storing 720 kilobytes of information. The exterior of the diskettes vary only slightly. With an HD diskette there is an additional window directly opposite the write-protect window. All other external aspects of the diskettes are the same. Refer to Figure 1-11 below to identify the parts of a double-density 3.5" diskette and a high-density diskette with its distinguishing window.

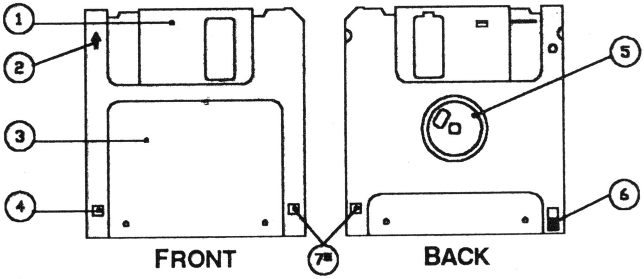


Figure 1-11. The front and back of a 3.5" floppy diskette (Double density and high-density differentiated below)

Refer to Figure 1-11 above to identify the following parts of a 3.5" floppy diskette.

Front of Diskette

1. The **Metal-Shutter** protects the floppy diskette within the plastic jacket, opening automatically when the diskette is properly inserted into the disk drive.

2. The **Directional Arrow** shows the correct direction to insert the diskette into the drive.

3. The **Label** is used to indicate diskette contents. Make a note on the label to remind yourself of what is stored on the diskette.

4. The **Write-Protect Window** indicates the status of write-protection. See the section "Write-Protecting Diskettes" in Chapter 2.

Back of Diskette

5. The **Drive Wheel** is the part at the center of diskette that the disk drive grabs to spin the diskette.

6. The **Write-Protect Block** enables or disables write-protection. When the block is moved so that the window is open, the diskette is write-protected. When the window is closed, the diskette is not write-protected.

*7. The **High Density Diskette Window** exists only on HD diskettes, distinguishing them from the lower capacity DD diskettes.

Laptop Care

The laptop will last a long time if you exercise care in handling it. The internal hard disk is the laptop's most delicate part. It cannot take a shock in excess of 5 G's when off or 2 G's when operating. Transporting the laptop should not cause any problem if you observe the following few guidelines:

1. Keep the laptop from extreme temperatures of hot or cold. See Appendix A for environmental limits.

2. Don't let the laptop get wet.

3. When transporting the laptop, take special care not to bump it into things. The internal hard disk is limited in how great of a shock it can take.

4. Do not attempt to use a power adapter other than the one that came with the laptop. Using the wrong adapter may damage the laptop's circuitry.

5. Do not place heavy objects on the casing of the laptop.

Diskette Care

To protect your data and insure maximum diskette lifetime, handle your diskettes with care. Below are some points you should observe in handling your diskettes.

1. Do not manually expose the disk surface inside the disk jacket by sliding the metal cover open. Touching the disk surface or allowing anything else to touch it may corrupt the data stored on that part of the diskette.
2. Since the information stored on the disk is recorded magnetically, you should keep the diskettes away from static electricity or other strong magnetic fields. (Many electrical devices or appliances emit such fields.)
3. Don't place objects on top of your diskettes.
4. Don't get them wet.
5. Don't expose them to high temperatures (like the inside of a car on a hot summer day).
6. Don't do anything else to the diskettes that could possibly damage them.

The bottom line is simple: if the information on your diskettes is important to you, then just take care of them.

CHAPTER 2

Using the Laptop

Introduction

In Chapter 1 you identified by name and location all the laptop's external features. Here we'll demonstrate how to *use* all those features identified in Chapter 1 and describe in greater detail all its major functional parts. We'll also discuss especially important points to remember in using them.

Before getting started, let's mention something about hard and floppy disk coverage: All disk activity described in this chapter is limited to floppy diskettes, particularly the system diskette supplied with your laptop. Here we cover only general hard disk concepts; it is not until Chapter 3 that you actually begin to use the hard disk. At that time we'll also cover more technical subjects like partitioning and formatting the hard disk.

Positioning the Carrying Handle

Now slide the carrying handle at the rear of the laptop from its hidden position to its elevating position as shown in Figure 2-1 below. In the elevating position, the handle places the laptop at a more suitable angle for typing. If you really don't like the handle in this position, just slide the handle back to the normal position. The carrying handle, as understood by its name, may also be used instead of the machine's carrying bag to tote the laptop. One note though about using the carrying handle to move the laptop:

NOTE:

> Be especially careful when carrying the laptop by its carrying handle. The laptop itself can safely be carried by the handle, but carelessness by the user may cause the laptop damage. When carrying the laptop by its carrying handle, take special care not to bump it into things. It cannot take the same kind of treatment as a briefcase.

The three diagrams below in Figure 2-1 show the carrying handle in its normal hidden position, its laptop-elevating position, and its carrying position.

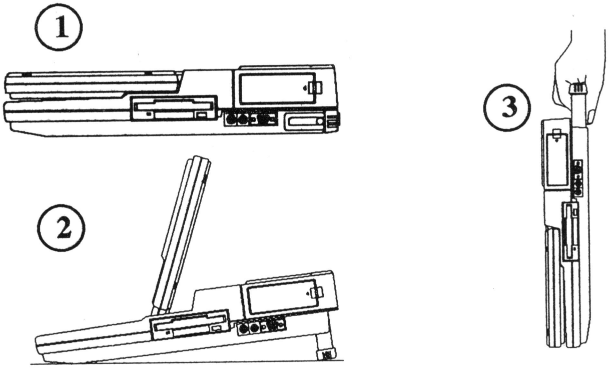


Figure 2-1. The carrying handle in its three positions: (1) Normal hidden position (2) Laptop-elevating position and (3) Carrying position.

Connecting the AC Adapter

Continue now to attach your AC adapter and power cord to the laptop according to the steps listed below. Refer to Figure 2-2 to make all the connections.

1. Connect the power cord to the AC adapter.

2. Connect the AC adapter to the power connecter on the left side of the laptop.

3. Connect the three-pronged end of the power cord to a live wall outlet.

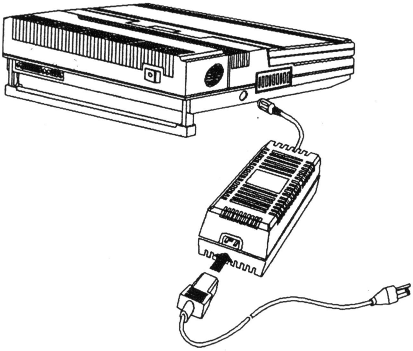


Figure 2-2. Connecting the AC adapter and power cord.

Charging the Battery

After connecting the adapter to the laptop and an outlet, the small power indicator on the top left of the laptop's upper cover should be blinking. This indicates that the battery is currently being charged. The following table defines the statuses of the power indicator. It will light according to the condition of the power supply.

Off	System off. AC adapter disconnected.
Blinking	Battery charging. AC adapter connected.
Red	Battery low. System on with AC adapter disconnected.

Yellow	Battery voltage between low and fully charged. System on with AC adapter disconnected.
Green	Battery fully charged. AC adapter connected.

When you receive the laptop, the internal battery has little or no charge. After your work session, leave the AC adapter connected to the AC outlet and the laptop for a total of 15 hours. This way the battery will be fully charged the next time you use the laptop. To know more accurately when the battery has been fully charged, just observe the power indicator as described above.

Handling Diskettes

Write-Protecting Diskettes

We continue our coverage of the laptop now with diskettes. Diskettes are not part of the laptop itself, but they are very important when it comes to using the laptop. In fact, its possible that you may use one or more floppy diskettes almost every time you turn on the laptop. In this chapter our use of disks will be limited completely to floppy diskettes. Not until Chapter 3 will we begin to talk about the hard disk. Now let's learn about write-protecting diskettes.

A diskette can be written to or formatted when it is *write-enabled* (the write-protect block covers the write-protect window). It cannot be written to or formatted when it is *write-protected* (the window is open). See Figure 2-3 below for a diagram of the positions of the write-protect block. Write-protection will protect the information on a diskette by not allowing the disk drive to write to it. This is important; when working with diskettes it's very easy to erase some or all the data on a valuable diskette. To protect yourself and your data, always write-protect important diskettes and use only their backup copies. See the DISKCOPY command in Chapter 3 for information on making backup copies.

To write-protect the MS-DOS diskette, hold or place the diskette in front of you as shown to the right in Figure 2-3. Open the write-protect window by sliding the write-protect block down until it clicks into place. Do this before inserting the diskette into the drive.

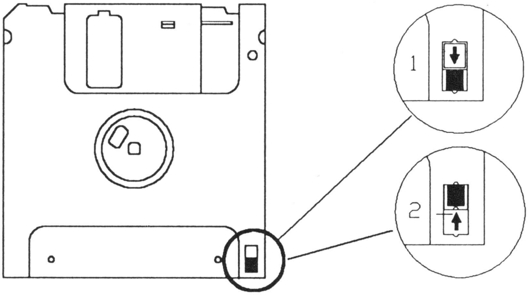


Figure 2-3. The floppy diskette write-protect block in its (1) open, write-protected, and (2) closed, write-enabled, positions.

Inserting a Diskette

Refer to Figure 2-4 below to insert your MS-DOS diskette into the floppy disk drive according to the steps outlined below.

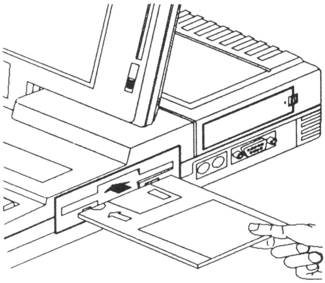


Figure 2-4. Inserting a diskette.

1. Hold the diskette with the arrow facing up and the metal-shutter end toward the drive.

2. Gently push the diskette into the drive.

3. The diskette is ready for use when it clicks into place.

Removing a Diskette

Now refer to Figure 2-5 below to remove your MS-DOS diskette from the floppy disk drive as described below.

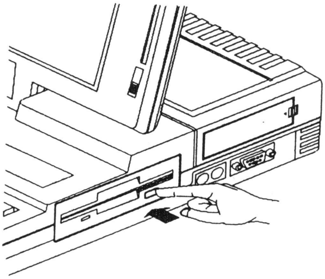


Figure 2-5. Removing a diskette from the drive.

1. Firmly push the diskette eject button.
2. The diskette will eject with a click.
3. Remove the diskette from the drive.

Notes on the Hard Disk

Here we point out a few things that are helpful to know before using the hard disk. You may want to skip this section for now and refer to it later when studying Chapter 3, especially the section on preparing the hard disk for use.

The LA-30A laptop may be shipped with either a 20 MB or a 40 MB hard disk. Other than the capacities of these disks, all features and functions are the same. All the points mentioned in this chapter apply to both 20 and 40 megabyte hard disks. For hard disk specifications, see Appendix A at the rear of this manual.

Preparing to Use the Hard Disk

Its a good idea to make sure the hard disk button on the indicator panel is in the depressed position (hard disk *enabled*) before powering on the laptop. Doing so will cause the system to initialize itself such that later, should the hard disk be turned off to save battery power, the laptop will continue to recognize the hard disk after it is turned back on. If the laptop is powered-on with the hard disk button in the raised position (hard disk *disabled*), later you will not be able to access the hard disk simply by pressing the HD button.

Suppose the system has been started normally (hard disk enabled at boot-up). If you're currently logged on to the floppy disk drive, i.e., drive A:, then type C:, nothing unusual will happen. The DOS prompt will change to C:\ with no indication that the hard disk has been powered off. But if you try to access the hard disk by reading information from, or by writing data to the hard disk, you'll get the following message:

```
Not ready error reading drive C
Abort, Retry, Fail? _
```

Since the system has already been initialized to recognize the hard disk, all you need to do is to depress the hard disk button, wait for the hard disk drive indicator to go off, and press <R> to retry.

Now suppose the system was started with the hard disk disabled, i.e., the HD button was not in the depressed position at power on. If you try to log on to the hard drive, or if you try to access the hard disk, the following message will be displayed:

```
Invalid drive specification
```

If this message displays on the laptop's screen, you'll need to carry out the following few steps to use the hard disk:

1. Save to a diskette any data in memory that you wish to keep.
2. Depress the HD button to turn on the hard disk power (HD Power Indicator will light).
3. Reset the laptop by pressing <Ctrl>, <Alt>, and <Delete>.

Conserving Battery Power

The laptop has a built-in rechargeable battery that may be used when AC power is not available. Since the use of battery power is limited in its duration, conservation will aid in preventing your work session from being cut short in the middle of a job. To conserve battery power when operating the laptop from its built-in rechargeable battery, turn the hard disk off when not using, and turn it on later when needed. But before doing so though, observe the following warning.

WARNING:

> DO NOT turn off the power to the laptop or the hard disk while the drive is writing information to the hard disk. Doing so may permanently damage the hard disk.

Also, refer to the foregoing section in this chapter "Preparing to Use the Hard Disk" for tips on how and when to turn the hard disk on and off.

Hard Disk Timed Stand-By Mode

One last feature of the hard disk needs to be mentioned here; that is, the hard disk automatic stand-by mode. This is one of the LA-30A's power-saving functions that's especially nice. The following paragraph explains what the stand-by mode is.

The stand-by mode is a function built-in to the circuitry of the hard disk itself. After three minutes (the default time) of no hard disk activity, the hard disk will spin down to save power. Later, if you need to use the hard disk again, there's no need to do anything special. When the laptop needs to transfer data to or from the hard disk, the disk will spin up again automatically. Because of the stand-by mode, you may not need to bother with manually turning the hard disk on and off to save battery power.

Starting the Laptop From the System Diskette

Now we come to turning the computer on. First, check the hard disk button on the indicator panel to insure that it is in the depressed position. Then insert the MS-DOS diskette into the floppy disk drive as previously described. Make sure the diskette clicks into place, then turn on the laptop from the power switch at the back. The laptop will boot itself from the diskette after a short self-test. This kind of reset may be called a cold start or a hard reset. While booting, the laptop will display a few messages, the first of which is the following:

```
286-BIOS (C)1987 American Megatrends Inc.,
XXXXX KB OK

Press <ESC> key to bypass MEMORY test






        (C) American Megatrends Inc.,

                XXXX-XXXXXX-XX
```

The laptop is testing memory while the above message is displayed. You may, if you wish, press the <Esc> key to bypass the memory test and save a few seconds.

NOTE:

> The X's in the screen display above and in those that follow represent information that is changeable. Different LA-30A laptops may vary in memory size and in certain other respects.

DO NOT press the <Delete> key at the next message. Wait until Chapter 4 to run the CMOS setup when adequate explanation will be given. You must know what the setup is and why you should run it before pressing <Delete> at the above prompt.

```
286-BIOS (C)1987 American Megatrends Inc

Press <Del> key to run SETUP
```

A few seconds later the laptop will display the current date and a prompt to change it. Press <Enter> without typing anything to leave the current date unchanged, or type the new date using the format displayed on the screen followed by <Enter>.

After the date, DOS will display the current time then prompt you to change it. Press <Enter> without typing a new time to leave the current time unchanged, or type the new time using the format displayed on the screen and press <Enter>

Finally, the DOS prompt **A>_** will appear at the left margin of the screen. "A" is the floppy disk drive specification. Whenever you see it, the laptop is prepare to use the floppy disk drive. Later you will use "C" which is the hard disk drive specification. It is at one of these prompts that you can enter DOS commands like **copy** and **comp**. Also at the DOS prompt you can run a word processor program, a data base program, or any other popular application program written for the IBM PC/AT and compatibles. See Chapter 3 or your MS-DOS manual for more information about DOS commands.

The LCD Screen and the Display Adapter

Backlight-Off Function

One important characteristic of the LCD screen should be mentioned first, one that you may have already discovered, that is, the Backlight-Off function. The Backlight-Off function causes the laptop's LCD to go blank after four minutes of no keyboard interaction. This is intended to protect the laptop's LCD from what is called burn-in. Whenever the LCD apparently goes off, but the laptop itself has not been turned off, just press any key to return the LCD to its normal *backlight-on* state.

Contrast Adjustment

Now that the computer is on with some information on the screen, experiment with the LCD display a little. Adjust the contrast lever directly to the right of the LCD display to see how the appearance of the screen can be varied. By adjusting the contrast, you can make the screen as clear as possible under various lighting conditions.

Normal/Inverse Video

Also, try changing the screen mode from normal video to inverse video by pressing the screen mode button on the indicator panel. The LED indicator directly above the button will go off while the laptop is in inverse video mode. Return to normal video by depressing the screen mode button again. Notice that the LED indicator will light again. Use both the screen mode button and the contrast adjustment lever to obtain the clearest possible LCD under varying lighting conditions.

Display Modes, Devices, and Commands

Built in to the circuitry of the laptop's main board are both a color graphics adapter (CGA) and a Hercules monochrome graphics adapter (MGA). *At the DOS prompt* press any of the four display mode commands listed below to control which display mode the laptop uses.

These display mode commands control not only the display mode (MGA or CGA), but also the display device, whether it be the laptop's LCD or an external monitor. The laptop's default display mode is LCD monochrome graphics, indicated by italics in the table below. The laptop implements LCD monochrome graphics every time the laptop is powered on or reset, and remains active until another display mode command is executed. If another display mode command is executed, the new display mode will remain active until the mode is changed again, or until the laptop is reset with <Ctrl> + <Alt> + <Delete>. Every time the laptop is turned on, monochrome graphics will be active. For emphasis we repeat now two important points to remember before changing the display mode:

1. **Do not** change the display mode except at the DOS prompt. Changing the mode at any other time will likely cause the system fail. The only way to recover from a system failure is to reboot the laptop with <Ctrl> + <Alt> + <Delete> or to turn the laptop off and then back on.

2. **Do not** activate one of the modes for an external monitor unless you've first connected your monitor to the laptop. See the section "External Monitor" in Chapter 6 for more information about connecting an external monitor to the laptop. Also, confirm that your monitor is compatible with the display mode you wish to use.

All the key combinations used in this manual including the display mode commands listed below are indicated by grouping the combination together and separating individual keys by plus signs, as with <Shift> + <Alt> + <1>. When executing one of the following keyboard commands, press and hold down the first two keys, press the last key of the combination, then release them all. The following table lists the display mode keyboard commands and the resolutions for the LA-30A's display modes for both the LCD and an external monitor. Italics in all such tables indicate default settings.

Monitor	Mode	Resolution	Key Combination
LCD	CGA	640x200	<Shift> + <Alt> + <1>
LCD	*MGA*	*720x348*	*<Shift>* + *<Alt>* + <2>
External**	CGA	640x200	<Shift> + <Alt> + <3>
External**	MGA	720x348	<Shift> + <Alt> + <4>

** The keyboard commands for an external monitor will not work unless you have a compatible monitor attached to the laptop. Refer to Chapter 6, "Expanding the Laptop", before executing these commands.

Display Modes and Installation Programs

The setup or installation programs of certain application software will request information about the display adapter and the monitor of your computer. Set the laptop's display mode for those programs before installation by using the keyboard commands listed above. When using MGA, the laptop's LCD will display in high resolution, so in an installation program you should specify that you're using a high resolution monitor, though you're actually using the same monitor as you would for CGA, that is, the laptop's LCD.

Shift Screen Commands

In LCD MGA mode (default), there is a further option concerning the display's mode of operation; that is, the laptop can display in either *text* or *graphics*. Whether you operate in text or graphics mode depends on the software you're running. Most simple word processors, for example, only run in text mode. They do not use the graphics capability of LCD MGA mode. For such programs that operate altogether in text mode, the Shift Screen Commands of this section do not apply. That's because in text mode everything displays normally on the LCD just as with any other monochrome monitor. But for other programs that can display graphics, it may be necessary to execute the LA-30A's Shift Screen commands to view the whole screen. When running a graphics program, what fits on one screen in LCD CGA mode may not all fit on the screen in LCD MGA mode. To remedy this situation, the LA-30A is equipped with two Screen Mode commands that enable you to scroll the screen to the left or right. Below are the names of the Shift Screen commands and the keys that activate them:

Description	**Keyboard Command**
Shift Left	<Alt> + <Shift> + <Left>
Shift Right	<Alt> + <Shift> + <Right>

Brightness Adjustment

Occasionally you may need to adjust the brightness of the LCD screen. Since this is a function that should only rarely need to be done, the laptop does not provide an easily accessible brightness adjustment lever on its exterior. To adjust the LCD brightness, you'll need to carry out the following few steps:

1. Turn off the laptop.

2. Move the rear of the laptop near the edge of a table or desk, then slide the carrying handle to its elevating position if its not already so positioned. Use a Phillips screw-driver to remove the three screws securing the rear cover. See Figure 2-6 below:

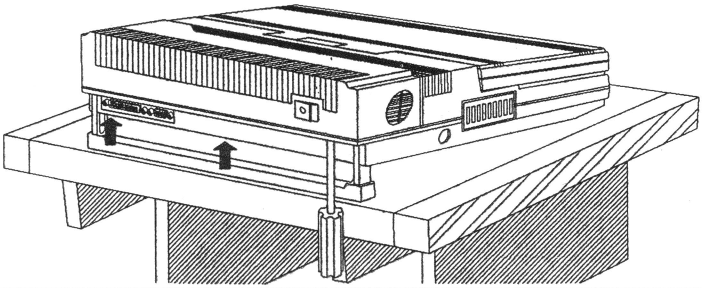


Figure 2-6. Removing the rear cover screws.

3. Remove the rear cover as shown in Figure 2-7. You may need to remove the option board access panel on the right side of the rear cover before removing the rear cover itself.

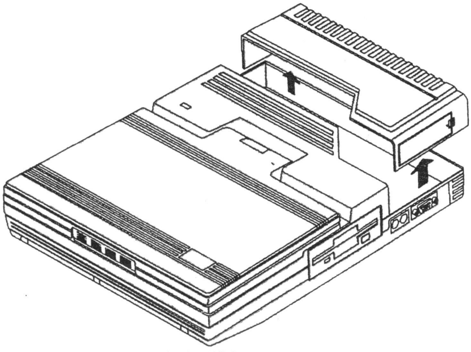


Figure 2-7. Removing the rear cover.

On the top of the power supply casing are two access holes to screw-type variable resistors. One of these should have been plugged at the factory. The other is for adjusting the LCD brightness and has been marked with a sticker reading "Brightness Adjustment" or "Backlight Adjustment." Before continuing with the next step, see the following warning below.

WARNING!!

Stop here before making any adjustments and read the following two statements carefully.

USE THE PLASTIC SCREW-DRIVER SUPPLIED WITH YOUR LAPTOP TO MAKE THE ADJUSTMENT AS DESCRIBED BELOW. USING A NORMAL METALLIC SCREW DRIVER MAY BLOW THE WHOLE POWER SUPPLY, INJURING YOU AND DESTROYING THE LAPTOP.

If for any reason there is more than one unplugged access hole on the top of the power supply, do not proceed with Brightness Adjustment. Adjusting the wrong variable resistor may permanently damage the circuitry of the LA-30A laptop. Let a service professional make the adjustment.

4. To adjust the brightness of the LCD screen, insert the plastic screw driver supplied with your laptop into the brightness adjustment access hole at the top of the power supply. Rotate the adjustment screw clockwise to increase brightness of the LCD, counter-clockwise to decrease brightness. The screw-type resistor can easily rotate about one half a turn. If it doesn't rotate in one direction, *don't force it*. Below we list again but more concisely the directions to rotate the adjustment screw:

   Clockwise rotation **increases** LCD brightness.
   Counter clockwise rotation **decreases** LCD brightness.

Refer to Figure 2-8 below to adjust the brightness of the LCD as previously described.

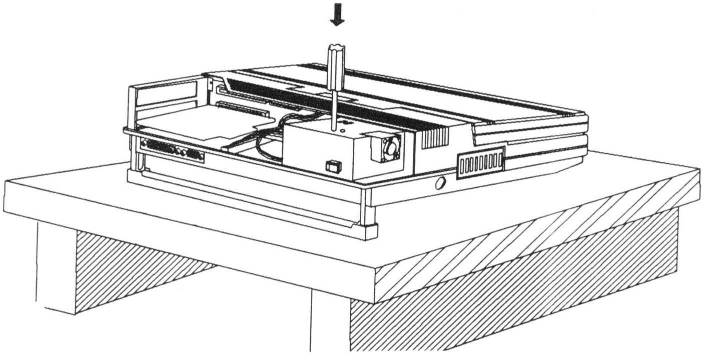


Figure 2-8. Adjusting LCD brightness level.

When you complete the adjustment, replace the rear cover, insert the cover screws, and replace the option board access panel if it was removed. To protect your laptop, be sure to observe the following:

IMPORTANT NOTE:

> When re-inserting the rear cover screws, make sure you do not apply any more pressure (torque) than necessary. The threads that the screws insert into can be stripped fairly easily.

Finally, turn on the power to the laptop to check your adjustment. If not satisfied, you may want to go through the whole procedure again.

FINAL NOTE:

> The method described here for adjusting the LCD brightness is, without a doubt, inconvenient. But on the positive side, its safe. It is possible to make this adjustment with the laptop power on, the method being more convenient in that you can see the effect of your adjustment as you make it. If you decide to try the adjustment with the power on, by all means be careful. And make sure you observe in detail the previous warnings in shaded boxed. Failure to do so may not only damage your laptop, but could very possibly cause serious personal injury.

Changing CPU Speed

One final thing you may occasionally need to do with the laptop is to change its CPU operating speed. Normally you should operate the laptop at high speed, 12 Mhz. This is the laptop's default operating speed and is indicated by italics in the table below. Operating the laptop at the slower speed only serves to allow certain special software to operate normally. The only time you'll need to change to slow speed, 6 Mhz, is when you run such software that cannot handle a high CPU operating speed. Generally, you should run the laptop at fast speed, switching to slow speed only when software exhibits a problem that can't be solved by other means.

CPU Speed	**Keyboard Command**
High speed--12 Mhz	*<Alt> + <Shift> + <Up>*
Low speed--6 Mhz	<Alt> + <Shift> + <Down>

A Final Word

This completes the basics of using the laptop. The next chapter will guide you into preparing your hard disk for use and making back-up diskettes. It will also introduce you to MS-DOS, a very important piece of software that you'll need every time you turn on the laptop.

CHAPTER 3

Using the Hard Disk and MS-DOS

Introduction

This chapter is a direct continuation of Chapter 2. Here you'll build on what you learned in the first two chapters and continue to make progress in making your laptop work for you. This chapter's purpose is two-fold: first, it will teach you how to perform several basic tasks that should be done soon after you receive the laptop; and second, it will introduce DOS and a few DOS commands to you.

A computer is many things to many people, but for most, it is not simply a toy, but a tool for getting jobs done. The more you know about your computer and its software, the more useful it will be to you. It can help to improve your work efficiency, and therefore the amount of work you can do in a fixed period of time. Undoubtedly you'll want to learn much more about DOS than this manual offers. This chapter is merely intended to help you get started using your laptop as soon as possible by guiding you through a few important steps. We highly recommend that you follow up this chapter with the six chapters in the MS-DOS User's Guide. It covers most everything you need to know to use DOS effectively. For any questions you have about DOS that are not answered in this manual, see the *MS-DOS User's Guide* or the *MS-DOS User's Reference* supplied with your laptop.

What is DOS?

DOS is an acronym for disk operating system. It is the software your laptop uses every time you turn the power on. Without it the laptop cannot operate. DOS has several parts. One part called BIOS is permanently stored in a chip on the laptop's system board. Another part of DOS is kept in three files on a disk, either a floppy diskette or a hard disk. Two of these files are hidden. The other, **command.com**, is not. DOS also has many other utility programs. These utility programs are the part of DOS that you'll interact with the most. It is not our purpose here to explain the function of every part of DOS. The *MS-DOS User's Guide* and *User's Reference* does a good job of that. Our purpose is to get started using DOS as soon as possible.

The terms MS-DOS and DOS are interchangeably used in this manual. DOS is a generic term. It may refer to the personal computer disk operating system from any of several companies. MS-DOS is Microsoft's version of DOS shipped with your laptop. Most other versions of DOS are functionally the same as MS-DOS.

Periodically Microsoft will update and improve its DOS. When the operating system is updated, the version or release number is also updated. MS-DOS 3.3 is the operating system shipped with your laptop, and "3.3" is the version number of that operating system.

System and Non-System Disks

The operating system, MS-DOS 3.3, as we mentioned before has two major parts. One part, called BIOS, is permanently located in computer memory. The other part is located on a bootable disk. To boot the laptop, the disk-based portion of the operating system must exist on the hard disk or on the diskette in the floppy disk drive. If the disk-based portion of the operating system is not available, the laptop cannot boot.

A bootable or system disk is a disk that can be used to reboot (restart) the laptop. If a diskette is bootable, you can insert it into the floppy disk drive and reset the system by turning the power off then back on, or by pressing <Ctrl>, <Alt>, and <Delete> simultaneously. When the laptop reboots, it reads information from the floppy diskette or the hard disk (depending on where the computer boots from) into computer memory, information that is vital for the operation of the laptop. This information is simply the disk-based portion of the operating system. Most application programs and game programs are sold with at least one bootable (system) diskette.

A disk without the operating system on it is called a non-system or non-bootable disk. A non-system disk cannot be used to reboot (restart) the laptop. To run a program on a non-system disk, the operating system must have already been loaded from another bootable disk. Since the operating system is not on non-system diskettes, there is more room to store your own programs or data.

Preparing the Hard Disk for Use

Because dealers and distributors vary in the extent to which they prepare their laptops' hard disks, we include this section to help you prepare the hard disk yourself if necessary. The following subsections cover standard ways to prepare a hard disk with the DOS programs FDISK and FORMAT. If your dealer has already prepared the hard disk either with DOS or with other hard disk software, you can disregard this section. But if you're not sure how the hard disk has been prepared, just continue with the following paragraphs. They will explain about everything you need to know to get the hard disk up and running.

Unless your dealer has told you otherwise, it's likely your hard disk needs some preparation. The only case in which it doesn't is if the hard disk is bootable and if all DOS files on the system diskette also exist on the hard disk. To check this out, do one of the following:

Laptop on: Remove any diskette from drive A: and press <Ctrl>, <Alt>, and <Delete> simultaneously.

Laptop off: Remove any diskette from drive A: and turn on the power.

If no error message appears, and the laptop logs on to the C: drive, then the hard disk is bootable. The only thing you need to check now is if the DOS files on your system diskette have been copied to drive C:, the hard disk. You can use the **DIR** command as explained later to do this. Number 3 under "Option 3" explains how to copy DOS files from the system diskette to the hard disk.

If any sort of error message does appear, then the hard disk is not bootable and needs at least a little preparation; you should continue with the next two paragraphs to find out exactly what preparation your hard disk needs.

This section on preparing the hard disk includes three subsections titled "Option 1", "Option 2", and "Option 3", each covering different preparation procedures depending on the capacity of your hard disk and the kind of preparation that needs to be done. By reading the next paragraph, you should be able to tell what kind of preparation your hard disk needs, select one of the following three options, and then go through each step of the option you select. Continue reading to determine which option is applicable to your hard disk.

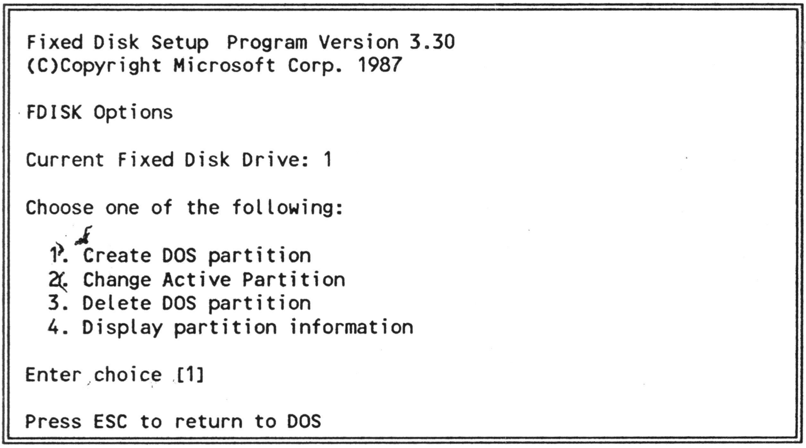
Your laptop should be on now, booted from the system diskette, and the DOS prompt should show **A>_**. To find out what sort of preparation your hard disk needs, just type **C:** and <Enter>. If an error message appears, then you need to continue with one of the following sections: "Option 1" if you have the standard 20 megabyte hard disk, or "Option 2" if you have a 40 megabyte disk. If when you type **C:** and <Enter> no error message appears and the DOS prompt becomes **C>_**, then you should jump to the section, "Option 3", to complete preparation by copying system and DOS files to the hard disk.

Option 1: 20 MB Hard Disk

Partitioning

The following are the procedures to create DOS partitions assuming that the entire hard disk will be used for MS-DOS V3.3. If your hard disk needs to be partitioned differently, refer to the DOS manual for more information regarding the FDISK command.

1. Boot with the DOS diskette in the floppy disk drive and enter the command "FDISK" at the **A>_** prompt. The following will appear:



```
Fixed Disk Setup  Program Version 3.30
(C)Copyright Microsoft Corp. 1987

FDISK Options

Current Fixed Disk Drive: 1

Choose one of the following:

  1. Create DOS partition
  2. Change Active Partition
  3. Delete DOS partition
  4. Display partition information

Enter choice [1]

Press ESC to return to DOS
```

2. Press <Enter> to create a DOS partition. **1. Create DOS partition** is the default. *Default* simply means that the software has already selected it. Therefore, all you need to do is press <Enter> to confirm that you want the default selection. The following will appear:

```
Create DOS Partition

Current Fixed Disk Drive: 1

   1. Create Primary DOS partition
   2. Create Extended DOS partition


Enter choice: [1]

Press ESC to return to FDISK Options
```

3. Press <Enter> to create a primary DOS partition. **1. Create Primary DOS partition** is the default. The next screen is:

```
Create Primary DOS Partition

Current Fixed Disk Drive: 1

Do you wish to use the maximum size
for a DOS partition and make the DOS
partition active (Y/N)         ? [Y]



Press ESC to return to FDISK Options
```

If the hard disk has already been partitioned, DOS will tell you that a primary partition already exists. If so, exit the FDISK program and jump to the next section, "Formatting and Copying DOS Files."

4. Press <Enter> (Yes is the default) to use one partition for the whole disk. For other ways to partition the hard disk, see your MS-DOS manual. MS-DOS will display the next message:

```
System will now restart

Insert DOS diskette in drive A:
Press any key when ready . . .
```

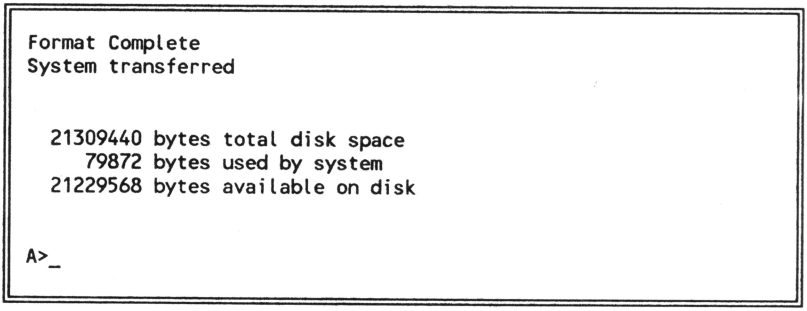
5. Insert the system diskette is in the floppy disk drive and press <Enter> at the previous message. The system will reboot and will request date and time information. If you don't want to change the displayed date and time, just press <Enter> at each prompt.

Formatting and Copying DOS Files

Confirm that the system diskette is in the floppy drive and that the DOS prompt is **A>**_ before beginning the format program. To format the hard disk, type **format c:/s** and press <Enter>. The following message will appear:

```
WARNING, ALL DATA ON NON-REMOVABLE DISK
DRIVE C: WILL BE LOST!
Proceed with Format (Y/N)?
```

Press <Y> and <Enter> to begin formatting. When the format is complete, the following information will appear. These numbers, by the way, may vary slightly from laptop to laptop. Only major differences should cause concern.



```
Format Complete
System transferred


  21309440 bytes total disk space
     79872 bytes used by system
  21229568 bytes available on disk


A>_
```

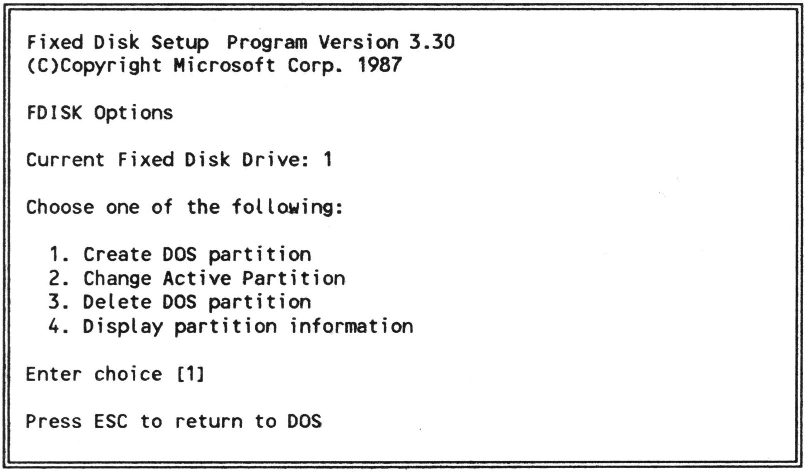
Next, type **copy a:*.* c:/v** and <Enter> at the **A>_** prompt. This copies all the non-hidden DOS files on the disk in drive A: to drive C:. The **/v** instructs the copy command to verify that the information is copied correctly.

Option 2: 40 MB Hard Disk

Partitioning

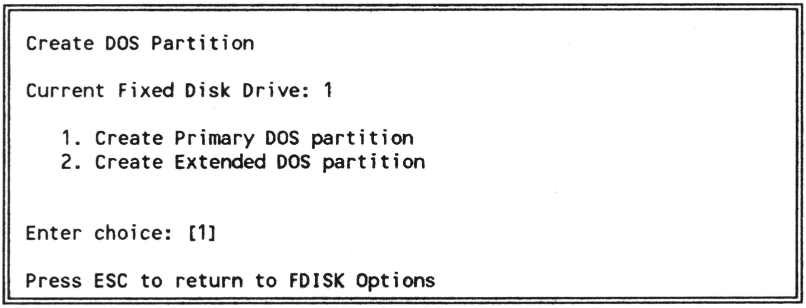
MS-DOS cannot make 40 megabyte partitions. The maximum partition size is about 32 megabytes. So to use a 40 megabyte hard drive with MS-DOS, you need to configure it in two partitions. The procedures below describe how to create two equal size DOS partitions of about 20 megabytes each. If you want your hard disk partitioned differently, refer to the MS-DOS manual for more information regarding the FDISK program.

1. Boot with the DOS diskette in the floppy disk drive and enter the command "`FDISK`" at the **A>_** prompt. The following will appear:



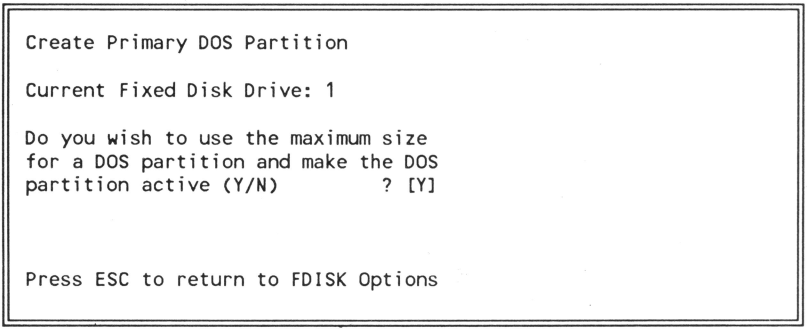
```
Fixed Disk Setup  Program Version 3.30
(C)Copyright Microsoft Corp. 1987

FDISK Options

Current Fixed Disk Drive: 1

Choose one of the following:

  1. Create DOS partition
  2. Change Active Partition
  3. Delete DOS partition
  4. Display partition information

Enter choice [1]

Press ESC to return to DOS
```

2. Press <Enter> to create a DOS partition. **1. Create DOS partition** is the default. ***Default*** simply means that the software has already selected it. Therefore, all you need to do is press <Enter> to confirm that you want the default selection. The following will appear:



```
Create DOS Partition

Current Fixed Disk Drive: 1

   1. Create Primary DOS partition
   2. Create Extended DOS partition


Enter choice: [1]

Press ESC to return to FDISK Options
```

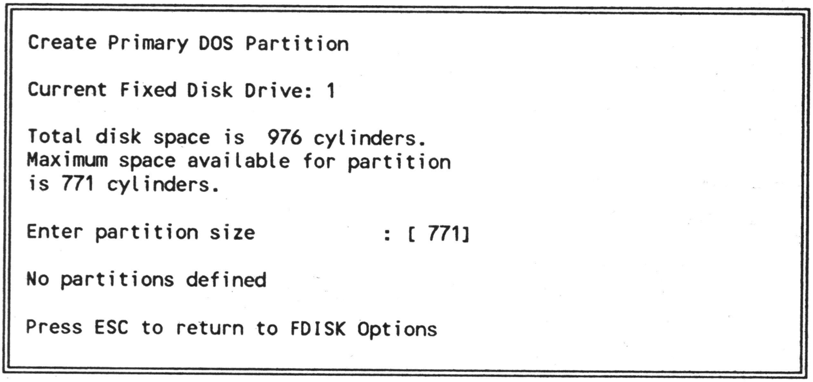
3. Press <Enter> to create a primary DOS partition. **1. Create Primary DOS partition** is the default. The next screen is:



```
Create Primary DOS Partition

Current Fixed Disk Drive: 1

Do you wish to use the maximum size
for a DOS partition and make the DOS
partition active (Y/N)         ? [Y]



Press ESC to return to FDISK Options
```

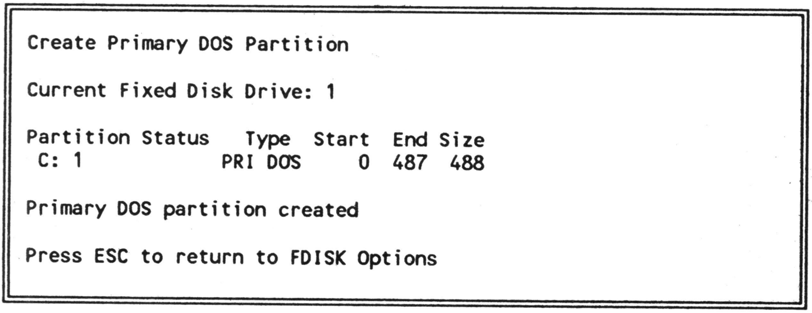
   If the hard disk has already been partitioned, DOS will tell you that a primary partition already exists. If so, exit the FDISK program and jump to the next section, "Formatting and Copying DOS Files."

4. Press <N> and <Enter>. After a few seconds, the FDISK program will display the following message:



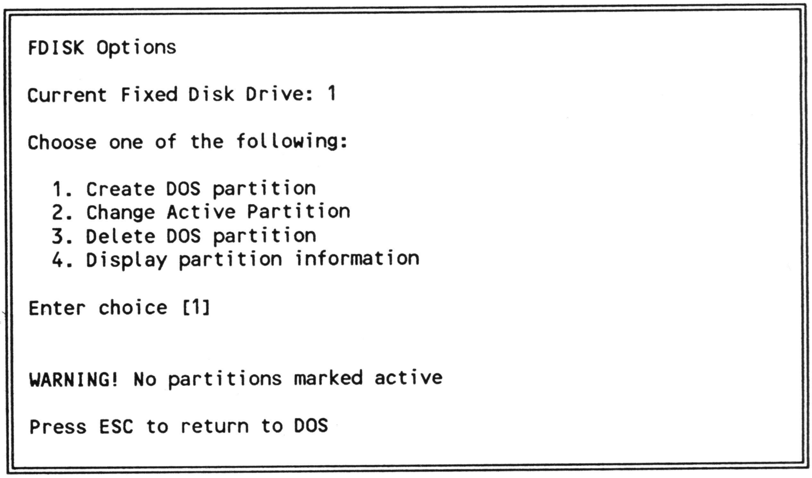
```
Create Primary DOS Partition

Current Fixed Disk Drive: 1

Total disk space is  976 cylinders.
Maximum space available for partition
is 771 cylinders.

Enter partition size             : [ 771]

No partitions defined

Press ESC to return to FDISK Options
```

5. The prompt will be blinking on the partition size, 771. To define the first of two partitions, just type **488** and <Enter>. You can change the size of the partition by typing a different number, but if you do so, instructions later in this section will not apply. These instructions are for defining two partitions of equal size. Refer to the MS-DOS manuals if you want partitions of different sizes. The next screen is:



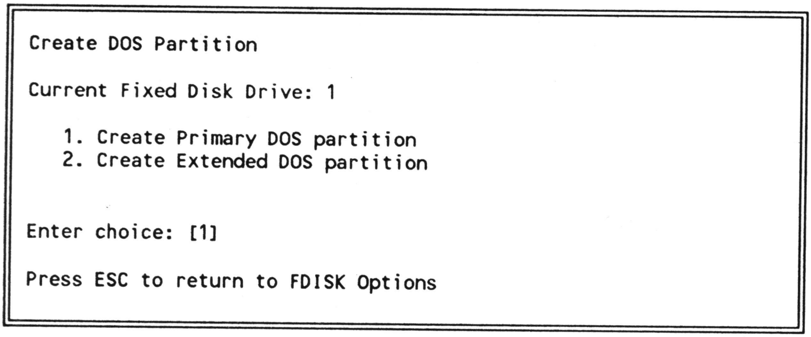
```
Create Primary DOS Partition

Current Fixed Disk Drive: 1

Partition Status   Type  Start  End Size
 C: 1            PRI DOS     0  487  488

Primary DOS partition created

Press ESC to return to FDISK Options
```

6. This screen shows that the first of two partitions has been created. It also shows that it is a primary DOS partition and that it will be referred to as the C: drive. Press <Esc> to return to the FDISK main menu to continue with the second partition. The next screen will appear:



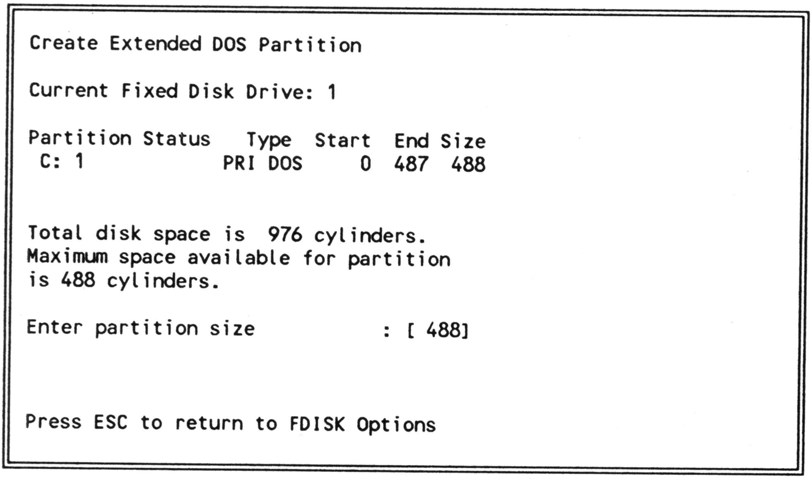
```
FDISK Options

Current Fixed Disk Drive: 1

Choose one of the following:

  1. Create DOS partition
  2. Change Active Partition
  3. Delete DOS partition
  4. Display partition information

Enter choice [1]


WARNING! No partitions marked active

Press ESC to return to DOS
```

7. **1. Create DOS partition** is the default, so just press <Enter> to begin the second partition and to proceed to the next screen.



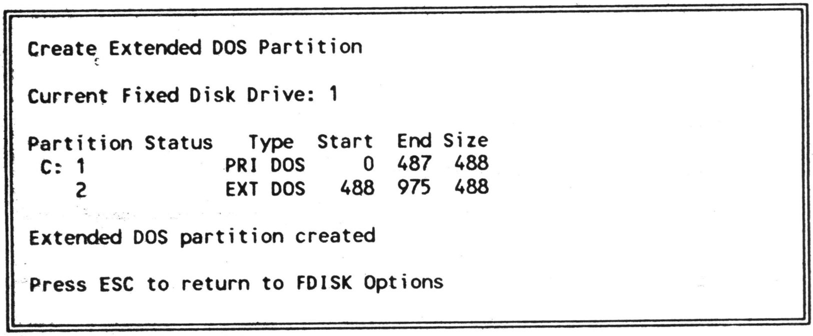
```
Create DOS Partition

Current Fixed Disk Drive: 1

   1. Create Primary DOS partition
   2. Create Extended DOS partition


Enter choice: [1]

Press ESC to return to FDISK Options
```

8. Press <2> and <Enter>. After a few seconds, the next screen will appear:



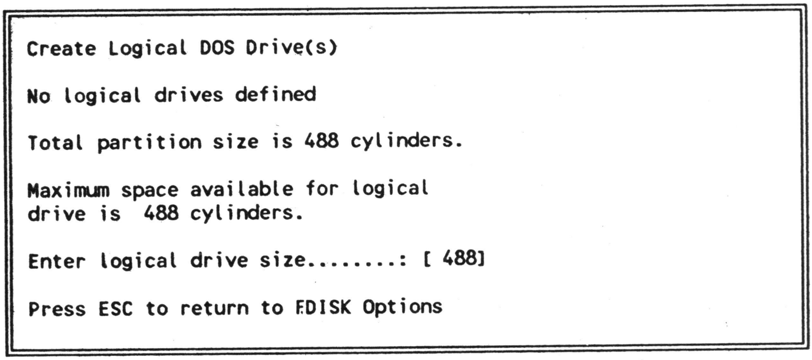
```
Create Extended DOS Partition

Current Fixed Disk Drive: 1

Partition Status   Type  Start  End Size
 C: 1            PRI DOS     0  487  488


Total disk space is  976 cylinders.
Maximum space available for partition
is 488 cylinders.

Enter partition size           : [ 488]



Press ESC to return to FDISK Options
```

9. Press <Enter> to accept the default of 488 cylinders. This will make a second partition the same size as the first. The next screen is:



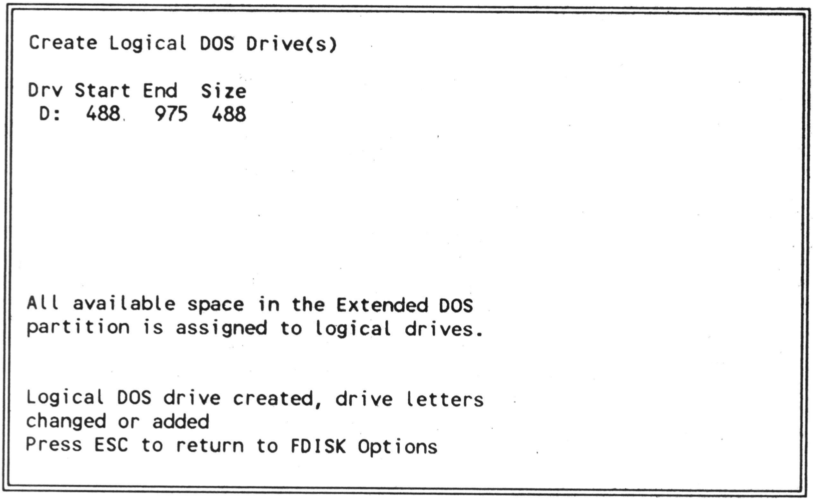
```
Create Extended DOS Partition

Current Fixed Disk Drive: 1

Partition Status   Type  Start  End Size
 C: 1             PRI DOS     0  487  488
    2             EXT DOS   488  975  488

Extended DOS partition created

Press ESC to return to FDISK Options
```

10. Now press <Esc>. The next screen below will request information about logical drive D, which will exist in the second, or extended DOS partition.



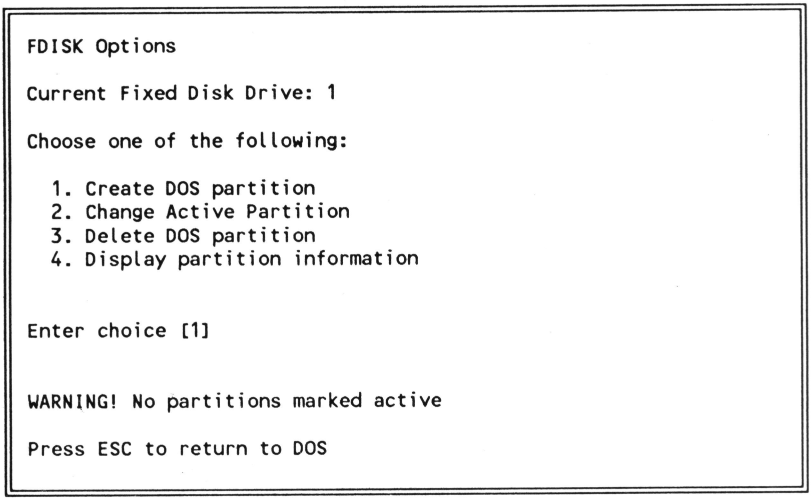
```
Create Logical DOS Drive(s)

No logical drives defined

Total partition size is 488 cylinders.

Maximum space available for logical
drive is  488 cylinders.

Enter logical drive size........: [ 488]

Press ESC to return to FDISK Options
```

11. Press <Enter> to accept the default value for logical drive size. We want the logical drive D to have the same size, 488 cylinders, as the extended partition that we already set. The next screen will display some information about the logical drive D.



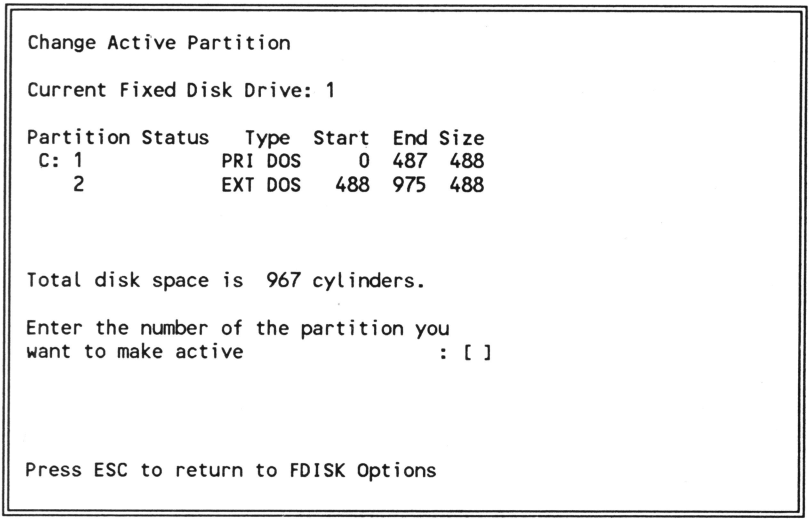
```
Create Logical DOS Drive(s)

Drv Start End  Size
 D:   488   975  488







All available space in the Extended DOS
partition is assigned to logical drives.


Logical DOS drive created, drive letters
changed or added
Press ESC to return to FDISK Options
```

12. Press <Esc> to return to the main menu. The next screen shows FDISK Options:



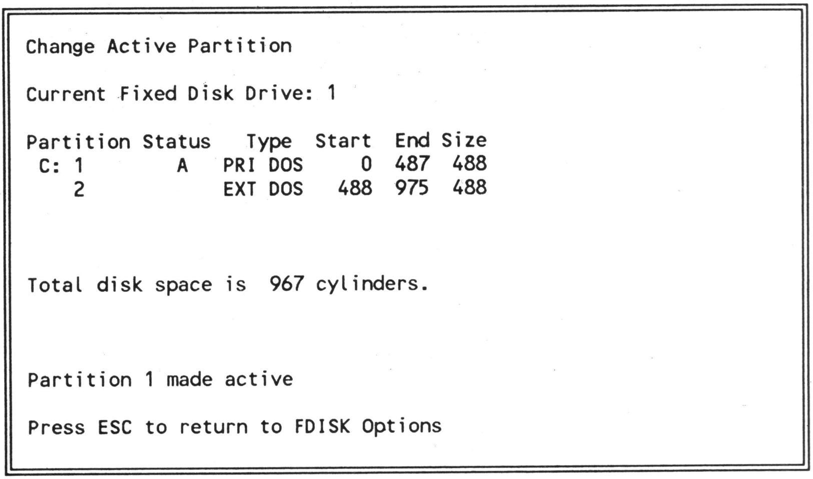
```
FDISK Options

Current Fixed Disk Drive: 1

Choose one of the following:

  1. Create DOS partition
  2. Change Active Partition
  3. Delete DOS partition
  4. Display partition information


Enter choice [1]


WARNING! No partitions marked active

Press ESC to return to DOS
```

13. The final step in partitioning the 40 megabyte hard disk is to specify which partition will be active. Press <2> and <Enter> at the main menu to move to the next screen.



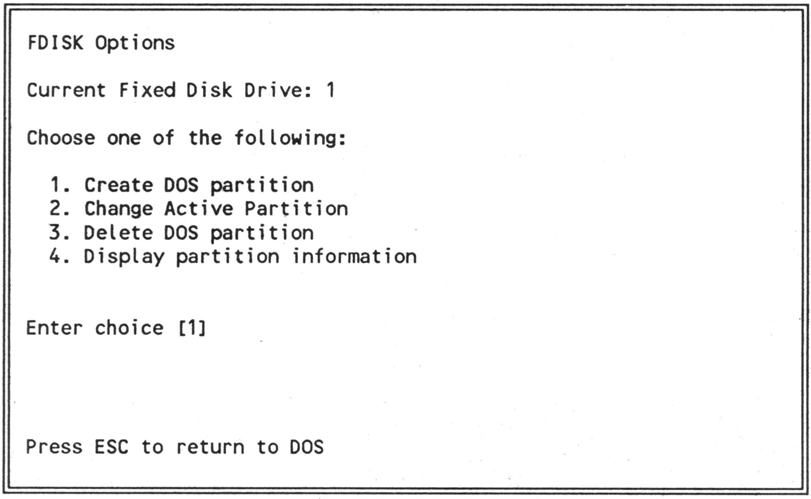
```
Change Active Partition

Current Fixed Disk Drive: 1

Partition Status   Type  Start  End Size
 C: 1            PRI DOS     0  487  488
    2            EXT DOS   488  975  488



Total disk space is  967 cylinders.

Enter the number of the partition you
want to make active                   : [ ]




Press ESC to return to FDISK Options
```

14. Press <1> and <Enter> to make the first partition active. This means that when you boot the laptop from the hard disk, the laptop will look to drive C:, not logical drive D:, for system files necessary for bootup. And the next screen is:



```
Change Active Partition

Current Fixed Disk Drive: 1

Partition Status   Type  Start  End Size
 C: 1       A    PRI DOS     0  487  488
    2            EXT DOS   488  975  488



Total disk space is  967 cylinders.



Partition 1 made active

Press ESC to return to FDISK Options
```

15. Now press <Esc> to return to FDISK Options.



```
FDISK Options

Current Fixed Disk Drive: 1

Choose one of the following:

  1. Create DOS partition
  2. Change Active Partition
  3. Delete DOS partition
  4. Display partition information


Enter choice [1]




Press ESC to return to DOS
```

16. Press <Esc> again to leave FDISK and return to DOS. The following message will appear:

```
System will now restart

Insert DOS diskette in drive A:
Press any key when ready . . .
```

17. Make sure the system diskette is in drive A and press any key at the previous message. After booting, the system will request the date and time. If you don't want to change the displayed date and time, just press <Enter> at each prompt.

This completes this section on partitioning the 40 megabyte hard disk. Continue now with the next section to format the logical drives on your hard disk.

Formatting and Copying DOS Files

Check to see that the system diskette is in the floppy drive and that you're logged on to the A: drive before beginning the format. To format the C: drive, type **format c:/s** at the **A>_** prompt and press <Enter>. The following message will appear:

```
WARNING, ALL DATA ON NON-REMOVABLE DISK
DRIVE C: WILL BE LOST!
Proceed with Format (Y/N)?
```

Type <Y> and <Enter> to begin formatting the C: drive, which, because two partitions exist on the hard disk, actually represents only half of your hard disk. When the format is complete, the following information will appear. These numbers, by the way, may vary slightly from laptop to laptop. Only major differences should cause concern.

```
Format Complete
System transferred


  21170176 bytes total disk space
     79872 bytes used by system
  21090304 bytes available on disk


A>_
```

Now do almost the same for the D: drive. Type **format d:** at the **A>_** prompt and press <Enter>. When the following message appears, type <Y> and <Enter> to begin formatting drive D.

```
WARNING, ALL DATA ON NON-REMOVABLE DISK
DRIVE D: WILL BE LOST!
Proceed with Format (Y/N)?
```

When the format is complete, the following information will appear:

```
Format Complete
System transferred


  21170176 bytes total disk space
  21170176 bytes available on disk


A>_
```

Again, these numbers may vary slightly from laptop to laptop. Only major differences should cause concern.

Now, type **copy a:*.* c:/v** and <Enter> at the **A>_** prompt. This copies all the non-hidden DOS files on the disk in drive A: to drive C:. The **/v** instructs the copy command to verify that the information is copied correctly.

Option 3: Copying System and DOS Files

If you followed the steps in one of the previous sections titled "Option 1" or "Option 2", you should skip this section. But if the laptop's hard disk was partitioned and formatted before you received the laptop, you should continued with this section to copy DOS files and possibly system files to the hard disk. The following paragraph will tell you if you need to copy system files to the hard disk.

If the hard disk was formatted with the /s switch as in **format c:/s**, then system files do not need to be copied to the hard disk. Even if you didn't format the hard disk yourself, you can check this out by simply rebooting the laptop from the hard disk. First, remove any diskette from the floppy disk drive, then reset the laptop by pressing <Ctrl>, <Alt>, and <Delete> simultaneously, or just turn the laptop power on if it is off (no diskette in drive A). If the laptop reboots successfully, then the hard disk is bootable indicating that system files have already been copied to the hard disk. In such a case, all you may need to do is to copy DOS files on the system diskette to the hard disk. Number 3 below explains how to do this.

If the laptop does not boot successfully, then the hard disk is not bootable even though it has been formatted. You will need to carry out the following four steps to transfer all the files on your MS-DOS diskette, including hidden system files, to the root directory of the hard disk. For clarification of directories, see your MS-DOS manual.

1. Place the system diskette in the floppy disk drive, make sure the hard disk button is depressed, and turn the power on, or press <Ctrl>, <Alt>, and <Delete> simultaneously if the laptop is already on. Again, make sure the hard disk button is depressed. Do not press <Delete> to run the CMOS setup utility. Enter the date and time when requested to do so. The DOS prompt must show **A>_** before continuing with step 2.

2. Type **sys c:** and <Enter>. **Sys** stands for system. This command copies MS-DOS system files from the current drive to the c: drive. The current drive is indicated by the system prompt **A>_**: ("A" is the name for the floppy drive and "C" for the hard disk drive.) The current drive now should be **A:**. The system files mentioned above are hidden; they cannot be displayed on the screen by using the DOS dir command, and are not copied by the copy command in step 3. They are one part of the disk-based portion of the operating system we mentioned earlier in this chapter.

   If there is a problem with this step, the laptop probably was not started correctly. In such a case, you should initialize the laptop to recognize the hard disk:

   a. Depress the hard disk button.

   b. Reset the laptop [press <Ctrl>, <Alt>, and <Delete> simultaneously].

   c. At the **A>_** prompt, type **sys c:** again and <Enter>.

3. Type **copy a:*.* c:/v** and <Enter>. This copies all the non-hidden DOS files on the disk in drive A: to drive C:. The **/v** instructs the copy command to verify that the information is copied correctly.

Booting the System from the Hard Disk

Once the operating system exists on the hard disk, carry out nearly the same procedures to boot from the hard disk as to boot from the MS-DOS diskette. The only difference is that you don't insert a diskette into the floppy disk drive. If the laptop is off, simply turn on the laptop. If the laptop is already on, press <Ctrl>, <Alt>, and <Delete> simultaneously.

NOTE:

> If a diskette is in the floppy disk drive, the laptop will try to boot from that diskette, even if the hard disk is bootable. If a non-bootable diskette is in the drive, an error message will appear.

DOS Commands

Now that the hard disk is ready for use, you can begin to do a few other things with DOS. In this section we introduce some of the most useful DOS commands. You may want to get started using them right away. If you need more information or examples on how to use them, refer to the *MS-DOS User's Guide* or the *MS-DOS User's Reference*.

Some of the commands listed here can be very damaging to information on your disks if not used correctly. Only you, the user of these commands, can make sure they don't do any destroying work. Before you execute a command, be sure you know what you want to do, and make sure you know how to use the DOS command. Also, always have a backup copy of your files so that if a mistake does occur (and be assured, eventually it will), you have a way to quickly restore the lost information.

The syntax of the DOS commands listed below are by no means complete. Many things like pathnames and certain options and switches have not been included in the syntax here. For a thorough understanding of these commands, consult the *MS-DOS User's Reference* or other DOS reference books.

Dir

This is the directory command. It provides a directory listing of files on a disk. Use it when you want to see what information you have on a diskette or your hard disk. The syntax of the command is as below:

```
dir [drive:][/p][/w]
```

The /p switch activates the page mode of the dir command. It causes the listing to pause when the screen is full. This is useful when there are many files on a disk and they can't all be displayed on the screen at once. Press any key to scroll to the next page.

The /w switch activates wide mode. The dir command in wide mode can display many more filenames on the screen than otherwise, but without some other file information included in normal and page modes.

If the current drive is C:, just type **dir** and <Enter> for a directory listing of your hard disk.

Copy

> Will overwrite one or more files with the new file(s) if they have the same names.

The commands dir, copy and del are three of the most used DOS commands in managing files on your disks. The copy command is the one you used earlier to transfer files on your MS-DOS diskette to your hard disk. The syntax of the copy command is listed below:

```
copy [drive1:]filename1  [drive2:]filename2 /v
```

Drive1 and *filename1* represent the source drive and file names respectively. *Drive2* and *filename2* likewise represent the destination drive and file name. The /v switch instructs the copy command to verify that the information is copied correctly.

Make sure the name you give filename2 is not the name of an existing file on your disk; otherwise, copy will overwrite the existing file with filename1 but with the name filename2. If you're not sure, use the dir command to see a listing of the files on the destination disk.

Del

Permanently deletes specified files

Del is a simple and possibly dangerous command. Use it to clean up your disk when you have unwanted files. The syntax is

```
del [drive:]filename
```

Format

Dangerous--destroys all information on target disk. Do not ever run this on the hard disk, drive C:, unless you know exactly what you're doing.

Before you can copy information to a new diskette, you'll need to prepare it for use, or format it. The empty diskettes that you buy in a store are usually unformatted. To use these diskettes, execute the format command, then use the copy command to transfer files to the newly formatted diskette.

WARNING:

Don't ever format a good diskette with data on it, unless you want to permanently erase all the information stored on it.

The syntax of the format command with switches that the laptop's floppy drive recognizes is listed below:

```
format drive:[/t:tracks][/n:sectors][/v][/s]
```

The /t and /n switches are needed to format a double density diskette (720 KB) in the floppy disk drive. They specify the number of tracks (/t) and the number of sectors (/n) to be used to format the target disk.

The /v switch allows you to add a volume label to the diskette.

The /s switch causes the system (two hidden system files) to be transferred to the newly formatted disk.

Other switches listed in the *MS-DOS User's Reference* are not supported by the laptop's diskette drive.

Listed below are the forms of the format command that you will most commonly use with the laptop.

Format Command	**Explanation**
format a:	Format a 1.44 MB diskette
format a:/s	Format a 1.44 MB system diskette
format a:/t:80/n:9	Format a 720 KB diskette
format a:/t:80/n:9/s	Format a 720 KB system diskette

Add /v to any of these commands to include a volume label.

Diskcopy

> Dangerous--destroys all information on target disk by copying new information to it.

This command is useful to make backup copies of your diskettes. It will make an exact duplicate of a source diskette. If the target diskette is new and unformatted, diskcopy will format the target disk before copying files.

With DISKCOPY the diskette you want to copy (the source diskette) has to be physically the same as the diskette you want to copy to (the target diskette). Since the laptop has only one floppy disk drive, the laptop must do something special to use this command. The laptop solves this problem by giving the floppy disk drive two names: A: and B:. A: and B: here are called logical drives. They act as separate disk drives but actually share the same physical drive. We mentioned before that the name of the floppy disk drive is A:. Now you can also call it B:. This applies not only for the diskcopy command, but for all DOS commands. When you use a DOS command with the B: drive specification, the laptop will prompt you to place the appropriate diskette in the floppy disk drive as shown below:

```
Insert diskette for drive X: and strike any key when ready
```

The X above may be A or B. At this prompt, place the appropriate diskette in the drive.

The syntax of the diskcopy command is listed below:

diskcopy [Drive1:] [Drive2:]

Drive 1: is the drive that contains the source diskette; Drive2: is the drive that contains the target diskette. If you use the command "diskcopy a: b:" a: would be the disk drive you want to copy from, the source drive, and b: the diskette you want to copy to, the target drive. When you use this command, follow the instructions on the screen to place the appropriate diskette in the drive.

After copying, diskcopy will display the following message:

```
Copy another diskette (Y/N)?_
```

Hit <n> and <Enter> to terminate diskcopy, or <y> and <Enter> to make another disk copy.

Keyboard Functions

The keyboard is used not only to key in information to the laptop, but also to perform other laptop-controlling functions such as stopping or starting an operation, printing the screen contents, etc. The following table lists DOS related key combinations for some useful functions.

Description	Keyboard Commands
System Reset.	Press <Ctrl>, <Alt>, and <Delete> simultaneously.
Terminate an operation.	Press <Ctrl> and <Pause> simultaneously.
Stop scrolling temporarily.	Press <Pause>.
Resume scrolling after a temporary pause.	Press any key.
Print data (echo text) from the screen line by line.	Press <Ctrl> and <Print Screen> simultaneously. Later, each time you type data and press <Enter>, the printer will echo what you typed.
Print data from the screen (the entire screen)	Press <Print Screen>

CHAPTER 4

The CMOS Setup

Introduction

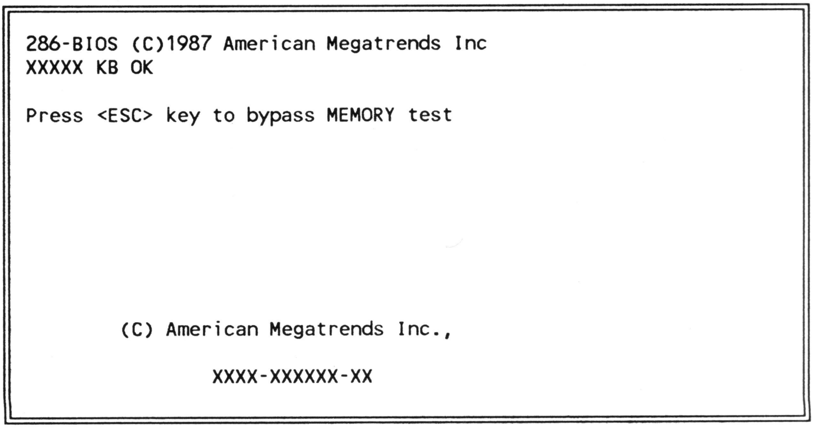
The setup procedure will need to be run under the following conditions:

1. The memory size has been changed. Expansion memory has been removed or added to the main board or to an expansion slot (as a memory option board).
2. The SETNEAT3 program has been run and the allocation of memory has been changed, either by enabling or disabling shadow RAM or by enabling or disabling EMS memory.

See "CMOS SETUP SUMMARY" at the end of this chapter for other times that the setup will need to be run.

The Start-up Screen

When you turn on the laptop power, BIOS will perform diagnostics of the system and display the following start-up screen:



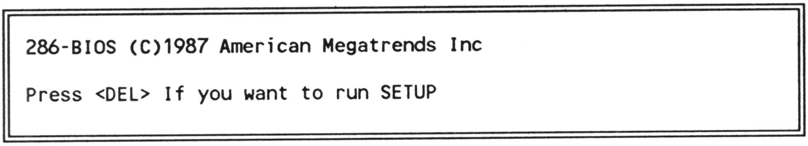
```
286-BIOS (C)1987 American Megatrends Inc
XXXXX KB OK

Press <ESC> key to bypass MEMORY test









        (C) American Megatrends Inc.,

                XXXX-XXXXXX-XX
```

Press <Esc> when the above message appears on the screen if you want to bypass the memory test. This feature of the BIOS saves some time when the memory installed is very large.

The reference number appears at the bottom of the screen. Record this number on page vi of this manual.

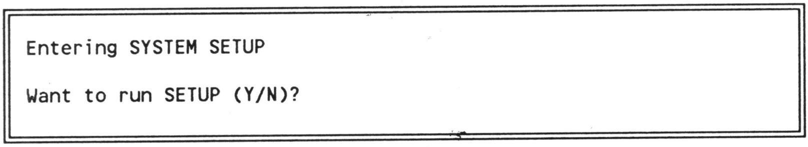
Beginning the CMOS Setup

After testing memory, the following screen will appear:



```
286-BIOS (C)1987 American Megatrends Inc

Press <DEL> If you want to run SETUP
```

To begin the setup, press the <Delete> key while the above message is displayed on the screen. If you wait too long before pressing the <Delete> key, you will need to reset the computer again by pressing <Ctrl>, <Alt>, and <Delete> simultaneously. Then when the above message displays again, press <Delete> to run the setup procedure. A new screen will appear upon pressing <Delete>.



```
Entering SYSTEM SETUP

Want to run SETUP (Y/N)?
```

Press <Y> and <Enter> to confirm that you want to run the setup procedure; <N> and <Enter> to abort the setup.

Date and Time

The first two items on the agenda are the date and time settings. See the beginning CMOS setup screen below:

```
              C M O S    S E T U P
==================================================
Current date is .................. XX-XX-XXXX
Enter new date (MM-DD-YYYY)? .....
```

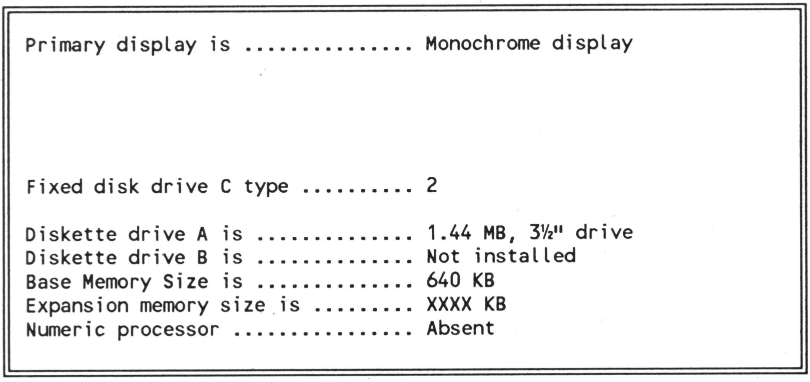
To enter the date, use the given format: MM for month, DD for day, and YYYY for year. If you want the current date to remain unchanged, just hit the <Enter> key. Next, the current time message will appear:

```
Current time is .................. XX:XX:XX
Enter new time (HH:MM:SS)? .......
```

To enter the time, use the above format: HH for hours, MM for minutes, and SS for seconds. Type in the new time and press <Enter>. If you want the current time to remain unchanged, press <Enter> without entering a new time.

Displaying Settings

After entering the date and time, the setup will display a listing of all its hardware settings. The settings for display type, hard and floppy disk types, base memory size, expansion memory size, and numeric processor are not manually resettable in the setup. The setup procedure itself will detect these settings by checking hardware then display the settings accordingly.



```
Primary display is ............... Monochrome display




Fixed disk drive C type .......... 2

Diskette drive A is .............. 1.44 MB, 3½" drive
Diskette drive B is .............. Not installed
Base Memory Size is .............. 640 KB
Expansion memory size is ......... XXXX KB
Numeric processor ................ Absent
```

NOTE:

The setting for expansion memory size will be affected by settings made with the NEAT setup (Chapter 5). You may actually have two megabytes of on board memory when the CMOS setup reports only 640 KB of base memory and no expansion memory. This may be due to the fact that the SETNEAT3 program had previously setup one megabyte as EMS memory and part of 384 KB as shadow RAM, leaving 640 KB for base memory and none for expansion memory. This is a typical setup covered in Chapter 5.

Rerunning Setup

To reject settings made during the first run of the setup, press <N> and <Enter> at the following prompt.

```
Are these options correct (Y/N)?
```

The laptop will not reboot or record the values to CMOS RAM, but will go through the setup all over again. A reboot will occur only when settings are accepted. The second running of the setup is exactly the same as the first.

The next time the above prompt appears, press <y> and <Enter> if you're ready to accept the new settings. The laptop will record the new settings in CMOS RAM then reboot the laptop.

CMOS Setup Summary

Because most of the laptop's hardware are fixed, the following settings are also *fixed* in the CMOS setup:

1. The presence and type of hard disk
2. The presence and type of floppy disk drive
3. Type of display card and monitor

Some aspects of the laptop's hardware are not fixed. The setup program will *detect* these by checking hardware:

1. Presence of a 80287 co-processor
2. Size of base memory
3. Presence and size of expansion memory

The setup will *request* the following information:

1. Date
2. Time

The BIOS will prompt you to run the setup under the following conditions:

1. CMOS options don't set.
2. Memory size mismatched. This may occur after running the SETNEAT3 program.
3. Hard disk setup error.
4. Battery low. Use the AC adapter.

CHAPTER 5

The NEAT Setup

The SETNEAT3 program is the setup utility for Chips and Technologies PC/AT Compatible NEAT CHIPSet: the 82C211, 82C212, 82C215 and 82C206, four chips on the main board of the LA-30A. With this program you can shift the allocation of available expansion memory between different management schemes, like shadow RAM and EMS memory.

This chapter is not a thorough explanation of the SETNEAT3 program. Our purpose here is merely to acquaint you with SETNEAT3, to explain how to load LA-30A pre-defined configuration files, and to explain how to enable or disable EMS. Also, our explanations assume a hardware configuration of one, two, or five megabytes of *on-board* memory, not expansion memory inserted into the XT or AT option board slots. See Chapter 6 if you have an LA-30A one or four megabyte memory expansion card. One section in that chapter explains how to upgrade on-board memory to two or five megabytes. The SETNEAT3 program described in this chapter has many technical functions that are beyond the scope of this manual. For a more complete explanation of SETNEAT3 functions, consult Chips and Technologies' documentation on this utility.

Chapter Definitions

Before we begin, let's first define some terms.

1. **Base Memory** is the maximum amount of memory that DOS can recognize. A computer running under DOS can have up to 640 kilobytes of base memory.

2. **Expansion Memory** refers to any additional memory above the base memory limit, base memory on the LA-30A being 640 kilobytes. Expansion memory can be either extended memory or expanded memory (EMS), but not both.

3. **Extended Memory** is expansion memory at or above one megabyte. For example, if you have a computer with one megabyte of memory, you normally could not have any extended memory. But with the LA-30A and the SETNEAT3 program, you can relocate the 384 KB of expansion memory just above 640 KB to an area above one megabyte. In this way, your expansion memory is in the position to be counted as extended memory.

4. **Expanded Memory** is also expansion memory, but is not limited to beginning at the one megabyte mark. Any memory you have above base memory, (640 KB on LA-30A) may be used as expanded memory simply by following the steps outlined in subsequent sections of this chapter.

5. **EMS** is short for *Expanded Memory Specification*. EMS is a popular and nearly standard implementation of expanded memory. In this manual EMS and expanded memory are used synonymously and are frequently interchanged.

6. **Shadow RAM** in this chapter refers to *Shadow for ROM BIOS*. Under SETUP SHADOW RAM of the SETNEAT3 main menu, you should not enable Shadow for Video RAM. Doing so will not cause the system to fail, but since the laptop does not have an EGA or VGA display, the system will not receive any profit by enabling shadow for video RAM.

   With shadow RAM, part of the computer instructions in the slower ROM (Read Only Memory) are copied to the faster RAM (Random Access Memory), causing the computer to execute its instructions faster. Your computer and software will therefore appear to operate faster when using shadow RAM

Shadow Ram and EMS Memory

The LA-30A laptop comes standard with one megabyte of memory. With a memory expansion card, it is possible to increase the LA-30A's on-board memory to two or five megabytes. Since DOS itself doesn't recognize memory above 640 kilobytes, there's the need for a memory management system to utilize the available memory above 640 kilobytes. The SETNEAT3 program, the LA-30A standard configuration files, and the EMS device driver (NEATEMM.SYS on your system diskette) are the software tools that will help you accomplish this goal.

There are, by the way, other methods to use expansion memory. Some memory management systems use extended memory to implement their system. Others require expanded memory. For those systems that operate under expanded memory, you'll first need to configure your laptop's available expansion memory as EMS. Then follow the manufacturer's instructions for the memory management system that you wish to implement. Two popular such memory management systems that you may want to use include a RAM disk (RAMDRIVE.SYS for MS-DOS) and a disk cache. Numerous disk caching programs are available from various software companies.

EMS is a memory management system that allows you to use memory beyond the IBM PC/AT 640 KB base memory limit. It uses a system of paging where a page is memory (16 KB) above the 640 KB limit and the page number to reference that above-the-limit (expanded) memory is held in base memory. With EMS, part of base memory is used to hold addresses of expanded memory page numbers, but with a massive increase of available RAM.

Memory Configurations

In this section, we'll discuss two kinds of memory configurations: standard and user defined. The standard configurations are simply those configurations defined by certain configuration files. These files are on your LA-30A system diskette and have an extension of CFG. The names and attributes of these files are listed below in Figure 5-1.

User defined configurations are simply that; they are defined by you, the user. In this chapter we'll first show you how to read a standard configuration. Next, we'll explain to what extent these files can be modified. Finally, we lead you step-by-step to modify a standard configuration file obtaining a configuration that's more appropriate for your computing needs.

Standard Configuration Files

The pre-defined configuration files on your disk are complete in themselves. Once read there may be no need to modify the configurations. But if you want to use your expansion memory for shadow RAM or EMS, the configuration can be changed by using the SETNEAT3 program.

Below we list in Figure 5-1 the three standard configuration files on your LA-30A system diskette. As you can see from the figure, their configurations are very simple; neither shadow RAM nor EMS are enabled. If you want to use shadow RAM or EMS, you'll need to modify one of these configurations as explained later.

File	On-Board	Config File Defaults	
Name	Memory Size	Shadow Ram	EMS
LA30#1MB.CFG	1	NO	NO
LA30#2MB.CFG	2	NO	NO
LA30#5MB.CFG	5	NO	NO

Figure 5-1. Standard LA-30A configuration files and attributes.

User Defined Configurations

In Figure 5-2 below we list some possible memory configurations for the LA-30A with respect to shadow RAM and EMS. Notice that the first line configuration for each memory size (marked by an asterisk) is simply a standard configuration as in Figure 5-1 above. The other configurations listed below for each memory size may be implemented by modifying the standard configurations. We'll explain how to do this in the following sections.

On-Board Memory Size		Shadow RAM	EMS	Maximum EMS Size
1 Megabyte	*1	NO	NO	N/A
	2	NO	YES	384 KB
	3	YES	NO	N/A
2 Megabytes	*4	NO	NO	N/A
	5	NO	YES	1 MB
	6	YES	NO	N/A
	7	YES	YES	1 MB
5 Megabytes	*8	NO	NO	N/A
	9	NO	YES	4 MB
	10	YES	NO	N/A
	11	YES	YES	4 MB

Figure 5-2. Possible LA-30A memory configurations.

Supplemental Configurations

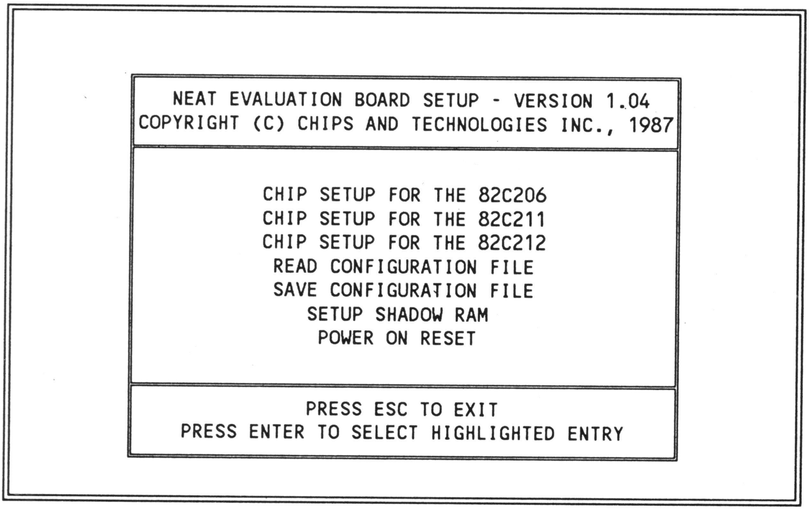
Just before the printing of this manual we added a number of NEAT configuration files to the LA-30A system diskettes. We'll call these files *supplemental configuration files* to distinguish them from the original standard configuation files listed in Figure 5-1 above. Using these supplemental configuration files makes working with the SETNEAT3 program immensely easier than before. By simply reading one of these configurations from the NEAT main menu, then selecting POWER ON RESET, you'll be able to implement any one of several different memory configurations with ease. One exception to this statement is covered in the *SHADOW RAM NOTE* in the section "Reading a NEAT Configuration File" later in this chapter. These new configuration files are listed below in Figure 5-3 along with a description of how they allocate memory.

File Name	**Description**
LA30#1MB.CFG	640 KB Base memory
LA30#1.EMS	640 KB Base memory, 384 KB EMS
LA30#1.EXT	640 KB Base, 384 KB Extended memory
LA30#1.SHW	640 KB Base memory, Shadow RAM
LA30#2MB.CFG	640 KB Base, 1024 KB Extended memory
LA30#2SH.EMS	640 KB Base, Shadow RAM, 1024 KB EMS
LA30#2SH.EXT	640 KB Base memory, Shadow RAM, 1024 KB Extended memory
LA30#5MB.CFG	640 KB Base, 4096 KB Extended memory
LA30#5SH.EMS	640 KB Base, Shadow RAM, 4096 KB EMS
LA30#5SH.EXT	640 KB Base memory, Shadow RAM, 4096 KB Extended memory

Figure 5-3. Supplemental configuration files on system disk.

Getting Started

If you copied the files on your system diskette to the hard disk as in Chapter 3, then these files, including SETNEAT3.COM and the accompanying configuration files, LA30#1MB.CFG, LA30#2MB.CFG, and LA30#5MB.CFG are all located in your hard disk's root directory. If you copied these files to a different directory, then the first thing you should do now is to change to that directory with the DOS Change Directory (CD) command. See the MS-DOS manual if you need more explanation on directories and directory commands. Once you're in the correct directory, type **SETNEAT3** at the DOS prompt and press <Enter>. The NEAT main menu will appear on your screen as shown below in Figure 5-4.



```
    NEAT EVALUATION BOARD SETUP - VERSION 1.04
COPYRIGHT (C) CHIPS AND TECHNOLOGIES INC., 1987

          CHIP SETUP FOR THE 82C206
          CHIP SETUP FOR THE 82C211
          CHIP SETUP FOR THE 82C212
           READ CONFIGURATION FILE
           SAVE CONFIGURATION FILE
              SETUP SHADOW RAM
               POWER ON RESET

               PRESS ESC TO EXIT
   PRESS ENTER TO SELECT HIGHLIGHTED ENTRY
```

Figure 5-4. The NEAT main menu.

In the center of the screen appears the seven items on the NEAT main menu. To select an item, move the cursor with the arrow keys to a menu item and press <Enter>. Then follow the instructions on the LA-30A's screen for the menu option you chose. See the note below before choosing any menu items.

NOTE:

The last menu item, POWER ON RESET, will record to the chips on the main board any changes in settings made with the other menu items. Do not choose this menu item unless you understand what you're doing or unless a section in this chapter instructs you to do so.

Reading a NEAT Configuration File

Should you want to use a pre-defined configuration, select the READ CONFIGURATION FILE menu item from the NEAT main menu. The setup will then request the name of the configuration file. The file you should read depends on the amount of on-board memory your LA-30A has. Type the name of the appropriate configuration file as listed in Figure 5-1 above, then press <Enter>. If you're in the wrong directory or using the wrong drive, a brief message FAILED will very briefly appear on the screen. Should you receive this message, change to the directory in which the SETNEAT3 program and configuration files are located in. Then try reading a configuration file again. SUCCESSFUL will briefly appear on the screen when the configuration file is read from the disk.

Here's one informative note that could save you a lot of frustration with the SETNEAT3.COM program.

SHADOW RAM NOTE:

Reading a configuration file will not update the SETUP SHADOW RAM settings. So even if you have a configuration file that's supposed to enable shadow RAM, you still need to enable shadow RAM manually under the SETUP SHADOW RAM menu item if these shadow RAM settings were not enabled the last time the laptop booted.

Implementing the New Configuration

When you're ready to implement the new configuration, select POWER ON RESET from the NEAT main menu and press <Enter>. The SETNEAT3 program will record the new settings to the NEAT chip set on the LA-30A's main board and then reboot the laptop with new settings. Writing these values to the NEAT chip set is not like writing to RAM. When you turn the computer off, these settings will not be forgotten. Rather, the settings you make will take effect *every* time you turn the computer on. There are only two ways to change the settings once they have been written to the chip set. One is simply to rerun the SETNEAT3 program, modify the settings, and reset the laptop with a new configuration. The other way is described below.

Restoring the Default Configuration

Suppose you read one of the standard configurations from disk, make some changes, select the POWER ON RESET menu item from the NEAT main menu and press <Enter>. Then even before the laptop boots, it dies; the laptop hangs up and will not respond. So what happened? Well, you just implemented a configuration that "kills" the laptop every time the power is turned on. Since the laptop remembers chip set configurations forever, what can be done? Fortunately, there's a laptop life-saving solution to this problem. As you turn on the power to the laptop, just hold down the <Insert> key for a couple seconds. The laptop will reset with the default configuration in BIOS. If you get a "Keyboard error" message shortly after powering on, you simply held the <Insert> key down too long. Just press <F1> to continue. If you still want a configuration other than the default, start the process all over again by typing SETNEAT3 to run the NEAT setup program.

Modifying a Standard Configuration

After a configuration file has been successfully read, you can use the other menu items of the NEAT main menu to modify the settings. The following few sections explain how to enable or disable shadow RAM and EMS. Before attempting to change the configuration though, check Figure 5-2 to confirm that the desired configuration is possible.

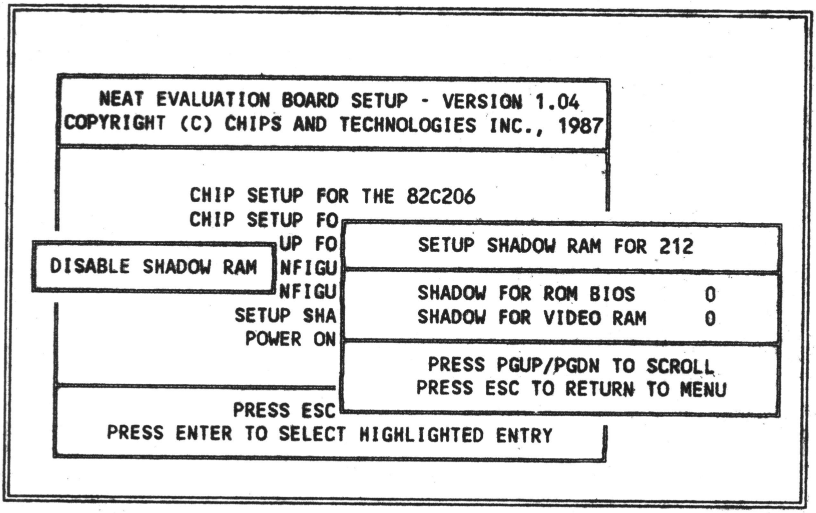
Shadow RAM

Shadow RAM in this chapter, as we mentioned earlier, refers to SHADOW FOR ROM BIOS. Under the SETUP SHADOW RAM menu item of the SETNEAT3 main menu, you should not try to enable *SHADOW FOR VIDEO RAM*. The laptop will not give an error message, but it will not recognize the setting you make.

There are two steps to enabling shadow RAM. First, select CHIP SETUP FOR THE 82C212 menu item from the NEAT main menu and press <Enter>. Move the cursor to RELOCATE DRAM AT 6401MB and set it to 0 (zero) by pressing <PgUp> or <PgDn> once. Remember, on the LA-30A compact keyboard, you need to use the <Fn> key to access the page-up and page-down keyboard functions. Press <Esc> to return to the main menu.

Next, select SETUP SHADOW RAM also on the NEAT main menu and press <Enter>. When the SETUP SHADOW RAM FOR 212 screen appears as in Figure 5-5 below, the cursor will be blinking on the SHADOW FOR ROM BIOS setting. When this screen appears, toggle the SHADOW FOR ROM BIOS setting to "1" by pressing <PgUp> or <PgDn> once. When you finish, press <Esc> to return to the NEAT main menu. Finally, choose POWER ON RESET from the SETNEAT3 main menu to implement your new configuration, a configuration which enables SHADOW FOR ROM BIOS.

You may desire to save a copy of your new configuration to a disk file before resetting. If so, select SAVE CONFIGURATION FILE from the SETNEAT3 main menu, then at the prompt type a name for your new configuration. It's recommended but not necessary that you use an extension of CFG for all your configuration files. Below in Figure 5-5 is the SETUP SHADOW RAM FOR 212 screen that you'll see when changing the SHADOW FOR ROM BIOS setting.



```
                NEAT EVALUATION BOARD SETUP - VERSION 1.04
        COPYRIGHT (C) CHIPS AND TECHNOLOGIES INC., 1987

                CHIP SETUP FOR THE 82C206
                CHIP SETUP FO
                          UP FO    SETUP SHADOW RAM FOR 212
      DISABLE SHADOW RAM  NFIGU
                          NFIGU    SHADOW FOR ROM BIOS       0
                     SETUP SHA     SHADOW FOR VIDEO RAM      0
                      POWER ON
                                    PRESS PGUP/PGDN TO SCROLL
                                   PRESS ESC TO RETURN TO MENU
                     PRESS ESC
        PRESS ENTER TO SELECT HIGHLIGHTED ENTRY
```

Figure 5-5. The NEAT setup: SETUP SHADOW RAM screen.

Expanded Memory Specification

The Expanded Memory Specification, EMS, Version 4 is a standard MS-DOS driver loaded at boot-up by the CONFIG.SYS file. There are two steps to load EMS. First, edit your CONFIG.SYS file to include a DEVICE=NEATEMM.SYS line. The driver, NEATEMM.SYS, is on your system diskette or on your hard disk if you copied it there. Second, since EMS is dependent on certain settings made in the NEAT Chipset, the SETNEAT3 program should be run to enable EMS, set its base address, I/O address, and size. Most of these parameters will already be set if you use a standard configuration. The following paragraphs explain in detail how to read, modify, and finally implement one of the LA-30A's standard SETNEAT3 configurations.

If the SETNEAT3 main menu is not already on your laptop's screen, follow the steps as explained in the previous section of this chapter, "Getting Started", to begin SETNEAT3 and to read a standard configuration file from the hard disk or system diskette.

The CONFIG.SYS file

The first step in setting up EMS on your laptop is to create or modify your CONFIG.SYS file. If you're not sure what the CONFIG.SYS file is or what its purpose is, refer to the section, "The Config.sys File" in Chapter 6 of your MS-DOS User's Guide.

You can create or modify the CONFIG.SYS file by using the DOS EDLIN program, or almost any word processor in ASCII (unformatted) mode. At a minimum, your CONFIG.SYS file should contain the following:

```
DEVICE = NEATEMM.SYS
```

The above line, without parameters or switches, will cause the EMS driver to be loaded with the default hardware values at the I/O address that enables EMS. These default values, including EMS enabling, are determined by the current NEAT configuration. These settings can be changed with the SETNEAT3 program.

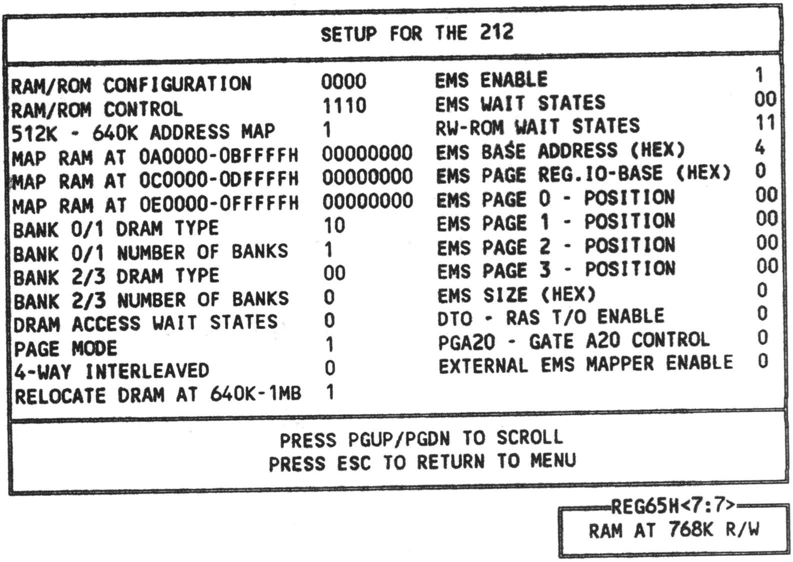
When you finish editing the CONFIG.SYS file, be sure to save it as an ASCII file to the root directory of the disk from which the laptop will boot, most likely the hard disk.

One Megabyte On-Board Memory Setup

The first step in setting up for EMS memory is to read the standard configuration file, LA30#1MB.CFG, as described in the previous section, "Reading a Standard Configuration File." Remember that with one megabyte of memory, you cannot have both shadow RAM and EMS. So if you have already set up your expansion memory as shadow RAM, you cannot set up EMS as described here.

To proceed with the setup of EMS in your expansion memory, choose the CHIP SETUP FOR THE 82C212 menu item and press <Enter>. When the 82C212 screen appears, press the arrow keys to move the cursor to the EMS ENABLE line at the top of the second column. Press <PgDn> (on the LA-30A compact keyboard press <Fn> and <Down> together) to toggle the setting to "1". Then move the cursor to the EMS SIZE (HEX) setting. If you have the standard memory setup, one megabyte on board, then the EMS SIZE (HEX) setting should be set to "0", less than one megabyte of EMS memory. Also, if you want to use EMS with only one megabyte of on-board memory, make sure shadow RAM is disabled before implementing the new configuration. Both shadow RAM and EMS enabled are not allowable on an LA-30A with only one megabyte of on-board memory. Before attempting to implement a new configuration, check Figure 5-2 to verify that the desired configuration is permissible.

When finished, the CHIP SETUP FOR THE 82C212 screen should appear as in Figure 5-6 below. This configuration is for one megabyte of on-board memory, 384 KB of which is for EMS. It's possible that one or more settings in the left hand column are different from what appear below. That's okay if the values on your screen originally came from the standard configuration file on your system diskette, LA30#1MB. The standard configuration files may be updated after the printing of this manual.



```
                              SETUP FOR THE 212

RAM/ROM CONFIGURATION       0000      EMS ENABLE                     1
RAM/ROM CONTROL             1110      EMS WAIT STATES               00
512K - 640K ADDRESS MAP     1         RW-ROM WAIT STATES            11
MAP RAM AT 0A0000-0BFFFFH  00000000   EMS BASE ADDRESS (HEX)         4
MAP RAM AT 0C0000-0DFFFFH  00000000   EMS PAGE REG.IO-BASE (HEX)     0
MAP RAM AT 0E0000-0FFFFFH  00000000   EMS PAGE 0 - POSITION         00
BANK 0/1 DRAM TYPE          10        EMS PAGE 1 - POSITION         00
BANK 0/1 NUMBER OF BANKS    1         EMS PAGE 2 - POSITION         00
BANK 2/3 DRAM TYPE          00        EMS PAGE 3 - POSITION         00
BANK 2/3 NUMBER OF BANKS    0         EMS SIZE (HEX)                 0
DRAM ACCESS WAIT STATES     0         DTO - RAS T/O ENABLE           0
PAGE MODE                   1         PGA20 - GATE A20 CONTROL       0
4-WAY INTERLEAVED           0         EXTERNAL EMS MAPPER ENABLE     0
RELOCATE DRAM AT 640K-1MB   1

                          PRESS PGUP/PGDN TO SCROLL
                         PRESS ESC TO RETURN TO MENU

                                                   REG65H<7:7>
                                                  RAM AT 768K R/W
```

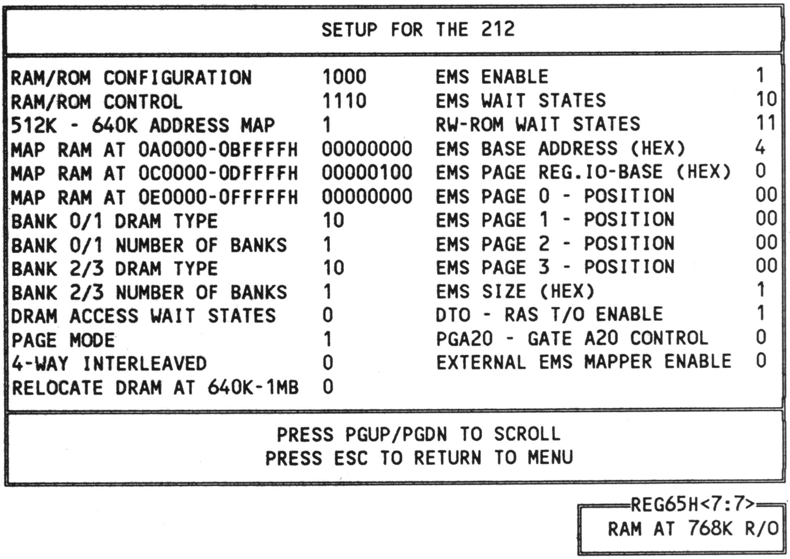
Figure 5-6. The CHIP SETUP FOR THE 82C212 screen after setting up for 384 KB of EMS memory.

Two Megabytes On-Board Memory Setup

The first step in setting up for EMS memory is to read the standard configuration file, LA30#2MB.CFG, as described in the previous section, "Reading a Standard Configuration File." By the time you get to this point in your reading, you may have already read this configuration file and set up shadow RAM. If such is the case, then you should not reread the configuration file. Doing so would cancel your shadow RAM setting. As Figure 5-2 shows, with two megabytes of on-board memory, you can have both shadow RAM and one megabyte of EMS. Now, to set up EMS in your expansion memory, continue with the following paragraph.

At the NEAT main menu, choose the CHIP SETUP FOR THE 82C212 menu item and press <Enter>. When the 82C212 screen appears, press the arrow keys to move the cursor to the EMS ENABLE line at the top of the second column. Press <PgDn> (on the LA-30A compact keyboard press <Fn> and <Down> together) to toggle the setting to "1". Then move the cursor to the EMS SIZE (HEX) setting. If you have two megabytes of on board memory, the EMS SIZE (HEX) setting should be set to "1", one megabyte of EMS memory. Before attempting to implement a new configuration, check Figure 5-2 to verify that the desired configuration is permissible.

When finished, the CHIP SETUP FOR THE 82C212 screen should appear as in Figure 5-7 below. This configuration is for two megabytes of on-board memory, 1 megabyte of which is for EMS. It's possible that one or more settings in the left hand column are different from what appear below. That's okay if the values on your screen originally came from the standard configuration file on your system diskette, LA30#2MB.CFG. The standard configuration files may be updated after the printing of this manual.



```
                              SETUP FOR THE 212

RAM/ROM CONFIGURATION        1000       EMS ENABLE                      1
RAM/ROM CONTROL              1110       EMS WAIT STATES                 10
512K - 640K ADDRESS MAP      1          RW-ROM WAIT STATES              11
MAP RAM AT 0A0000-0BFFFFH    00000000   EMS BASE ADDRESS (HEX)          4
MAP RAM AT 0C0000-0DFFFFH    00000100   EMS PAGE REG.IO-BASE (HEX)      0
MAP RAM AT 0E0000-0FFFFFH    00000000   EMS PAGE 0 - POSITION           00
BANK 0/1 DRAM TYPE           10         EMS PAGE 1 - POSITION           00
BANK 0/1 NUMBER OF BANKS     1          EMS PAGE 2 - POSITION           00
BANK 2/3 DRAM TYPE           10         EMS PAGE 3 - POSITION           00
BANK 2/3 NUMBER OF BANKS     1          EMS SIZE (HEX)                  1
DRAM ACCESS WAIT STATES      0          DTO - RAS T/O ENABLE            1
PAGE MODE                    1          PGA20 - GATE A20 CONTROL        0
4-WAY INTERLEAVED            0          EXTERNAL EMS MAPPER ENABLE      0
RELOCATE DRAM AT 640K-1MB    0

                          PRESS PGUP/PGDN TO SCROLL
                         PRESS ESC TO RETURN TO MENU

                                                           REG65H<7:7>
                                                         RAM AT 768K R/O
```

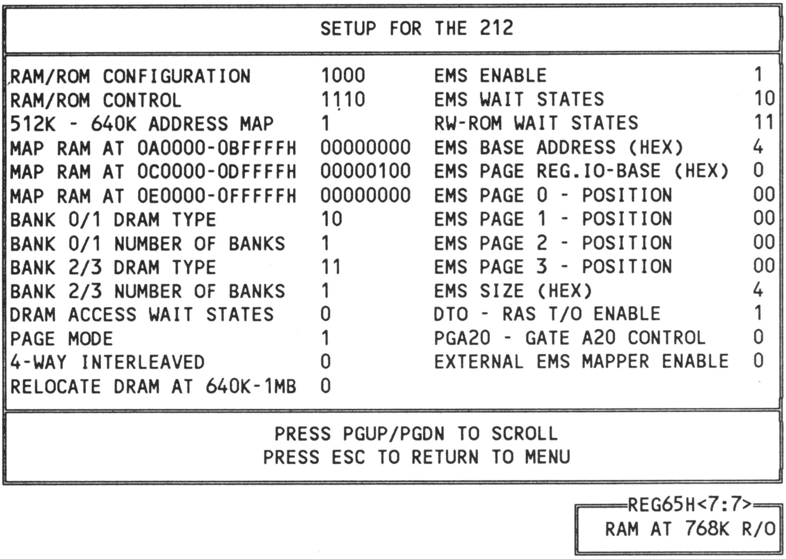
Figure 5-7. The "CHIP SETUP FOR THE 82C212" screen after setting up for one megabyte of EMS memory.

Five Megabytes On-Board Memory Setup

The first step in setting up for EMS memory is to read the standard configuration file, LA30#5MB.CFG, as described in the previous section, "Reading a Standard Configuration File." By the time you get to this point in your reading, you may have already read this configuration file and set up shadow RAM. If such is the case, then you should not reread the configuration file. Doing so would cancel your shadow RAM setting. As Figure 5-2 shows, with five megabytes of on-board memory, you can have both shadow RAM and four megabytes of EMS. Now, to set up EMS in your expansion memory, continue with the following paragraph.

At the NEAT main menu, choose the CHIP SETUP FOR THE 82C212 menu item and press <Enter>. When the 82C212 screen appears, press the arrow keys to move the cursor to the EMS ENABLE line at the top of the second column. Press <PgDn> (on the LA-30A compact keyboard press <Fn> and <Down> together) to toggle the setting to "1". Then move the cursor to the EMS SIZE (HEX) setting. If you have five megabytes of on board memory, the EMS SIZE (HEX) setting should be set to "4", four megabytes of EMS memory. Before attempting to implement a new configuration, check Figure 5-2 to verify that the desired configuration is permissible.

When finished, the CHIP SETUP FOR THE 82C212 screen should appear as in Figure 5-8 below. This configuration is for five megabytes of on-board memory, 4 megabytes of which is for EMS. It's possible that one or more settings in the left hand column are different from what appear below. That's okay if the values on your screen originally came from the standard configuration file on your system diskette, LA30#5MB. The standard configuration files may be updated after the printing of this manual.



```
                              SETUP FOR THE 212

RAM/ROM CONFIGURATION       1000      EMS ENABLE                      1
RAM/ROM CONTROL             1110      EMS WAIT STATES                 10
512K - 640K ADDRESS MAP     1         RW-ROM WAIT STATES              11
MAP RAM AT 0A0000-0BFFFFH   00000000  EMS BASE ADDRESS (HEX)          4
MAP RAM AT 0C0000-0DFFFFH   00000100  EMS PAGE REG.IO-BASE (HEX)      0
MAP RAM AT 0E0000-0FFFFFH   00000000  EMS PAGE 0 - POSITION           00
BANK 0/1 DRAM TYPE          10        EMS PAGE 1 - POSITION           00
BANK 0/1 NUMBER OF BANKS    1         EMS PAGE 2 - POSITION           00
BANK 2/3 DRAM TYPE          11        EMS PAGE 3 - POSITION           00
BANK 2/3 NUMBER OF BANKS    1         EMS SIZE (HEX)                  4
DRAM ACCESS WAIT STATES     0         DTO - RAS T/O ENABLE            1
PAGE MODE                   1         PGA20 - GATE A20 CONTROL        0
4-WAY INTERLEAVED           0         EXTERNAL EMS MAPPER ENABLE      0
RELOCATE DRAM AT 640K-1MB   0

                          PRESS PGUP/PGDN TO SCROLL
                         PRESS ESC TO RETURN TO MENU

                                                      REG65H<7:7>
                                                      RAM AT 768K R/O
```

Figure 5-8. The "CHIP SETUP FOR THE 82C212" screen after setting up for four megabytes of EMS memory.

Implementing the New Configuration

When changes to the 82C212 are complete, press <Esc> to return to the SETNEAT3 main menu. If you want to save the new configuration to disk, choose the SAVE CONFIGURATION FILE menu item, type a name (maybe LA30EMS.CFG), and press <Enter>. Make sure you don't use the same name as one of the pre-defined configuration files. You should preserve those files in case you need them later.

Finally, to put your changes into affect, choose the POWER ON RESET menu item and press <Enter>. The laptop will record the new settings to hardware and proceed to reboot. If the laptop hangs up, read the section "Restoring the Default Configuration" earlier in this chapter.

Messages

When the EMS driver is first executed, a title and copyright notice appear on the screen as follows:

```
EMS Expanded Memory Device Driver  Ver. 4.X
Copyright (c) Chips and Technologies Inc., 1987
```

If the EMS driver detects another EMS driver, it will display this message:

```
An Expanded Memory Manager has already been installed.
```

The second EMS driver, therefore, will not load.

When the EMS driver is loaded by MS-DOS, an internal check is performed on the EMS hardware configuration. If the driver detects any conflicts that would cause EMS to malfunction, the message

```
The EMS setup has been incorrectly specified.  No EMS is
available.
```

will appear on the screen after EMS and its copyright notice has been disabled. If the EMS hardware is configured properly and the I/O address is overridden by the command line parameter, the screen will show this message:

```
The EMS I/O address has been changed.
```

If the EMS page frame address is overridden from the command line, the following message will appear:

```
The EMS Frame Segment has been changed.
```

If the diagnostics option is selected, the message below will appear on the screen:

```
Testing EMS Expanded Memory Page Number: NNN
```

The NNN represents the page number currently being tested. If the diagnostics fail, EMS will be disabled and the following message will appear on the screen:

```
Expanded Memory FAILED diagnostics test.
```

If the diagnostics pass the test, or if diagnostics were not specified in the command line, the EMS driver will be loaded correctly and EMS enabled. The final message to appear on the screen is:

```
There are XXX pages, or YYYY Kilobytes of EMS Expanded Memory on
the system.
```

If loaded correctly, the system can be used to support Lotus/Intel/Microsoft EMS in the same manner as standard EMS cards.

Supplementary CONFIG.SYS Information

The command line, DEVICE = NEATEMM.SYS, without parameters or switches will cause the EMS driver to be loaded with the default hardware values at the I/O address that enables EMS. These default values, including EMS enabling, are determined by the current NEAT configuration. These settings can be changed with the SETNEAT3 program.

The line, DEVICE = NEATEMM.SYS, is all that is needed in the CONFIG.SYS file to implement EMS. But if you want to override the default values, the EMS device driver command line may contain the following parameters:

```
DEVICE = NEATEMM.SYS -Ix -My -Pzz -D
```

where

I = I/O address to enable EMS pages
M = page frame address (address of 64K window)
P = maximum number of open processes (default 64)
zz = number of processes (1-128)
D = enable EMS diagnostics;

and

X	Address	Y	Address
0	208H	1	C0000H
1	218H	2	C4000H
5	258H	3	C8000H
6	268H	4	CC000H
A	2A8H	5	D0000H
B	2B8H		
E	2E8H		

When finished editing the CONFIG.SYS file, be sure to save it as an ASCII file to the root directory of the disk from which the laptop will boot, most likely the hard disk.

A Final Word

If you follow all the instructions accurately as explained in this section, you should not have any problems loading EMS. If there is a problem, first check your CONFIG.SYS file and then the 82C212 settings by running SETNEAT3 again. If you still have a problem, go through this chapter again to read and implement the appropriate standard configuration file. Finally, try modifying the standard configuration file in order to implement EMS as explained earlier in this chapter. If you still have problems, check the following list of messages.

CHAPTER 6

Expanding the Laptop

Many features have been built in to the laptop to allow for expansion. With connectors at the left and back of the laptop, it's easy to attach an external monitor, an external keyboard, a parallel device, and two serial devices. Internally, expansion slots enable installation of two half-size option boards. The laptop may be expanded internally by installing up to 5 MB on-board memory and an 80287-8 numeric processor.

External Monitor

Choosing an External Monitor

Many kinds of monitors that accept TTL signals work well with the laptop including RGB, monochrome, dual-frequency and multi-frequency. An RGB monitor uses CGA and can display in three colors. A monochrome monitor uses MGA (Hercules) to display with higher resolution, but only in one color. A dual or multi-frequency monitor should support both monochrome and color graphics. Keep in mind when selecting a monitor that the LA-30A has two built-in display modes. You will therefore probably want to select a monitor that can take advantage of either of these modes. If such is the case, a dual-frequency (or double sync) monitor should be sufficient. A multi-freqency monitor is generally more expensive and doesn't provide any significant additional features over a dual-freqency monitor when used only with the LA-30A.

When attaching an external monitor, first connect the monitor's display adapter to the display connector at the rear of the laptop. See Figure 6-1 for attaching the display adapter to the laptop.

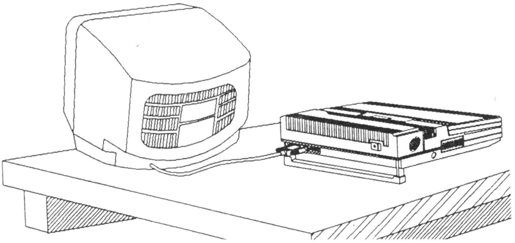


Figure 6-1. Attaching an external monitor.

Setting the Screen Mode

Next, turn on the power to the laptop and the external monitor and execute the appropriate screen mode command for an external display. Any of the commands listed below may be issued from the keyboard to change the screen mode. Italics in the table below indicates the laptop's default screen mode. Executing this command will have no effect unless you've previously changed the screen mode to one of the other three.

Screen Mode	Key Combinations
LCD CGA graphics mode (640x200)	Press <Alt>, <Shift>, and <1>.
LCD monochrome text/graphics mode (640x350)	*Press <Alt>, <Shift>, and <2>.*
External monitor (CRT) color graphics mode (640x200)	Press <Alt>, <Shift>, and <3>.
External monitor (CRT) monochrome graphics mode (720x348)	Press <Alt>, <Shift>, and <4>.

CAUTION:

> Do not change the screen mode except under the DOS prompt. Most software packages should be installed according to a certain screen modes before they run. Switching between color graphics and monochrome graphics modes while a program is running may halt the laptop and alter data in memory. To avoid problems, the screen mode should be changed only at the DOS prompt. If you use an external monitor, make sure the monitor is compatible with the laptop's screen modes.

External Keyboard

With the LA-30A you have the option of using an external keyboard instead of the built-in compact keyboard. While traveling you'll probably want to continue to use the built-in keyboard, then at home, if you like, use the supplied adapter to attach a standard size keyboard. Figure 6-2 shows how to use the supplied adapter to attach an external keyboard.

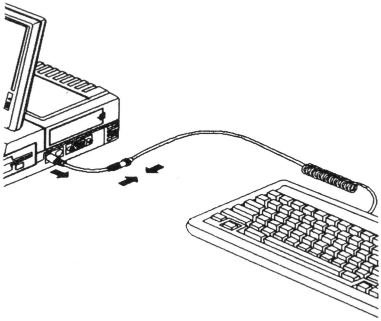


Figure 6-2. Attaching an external keyboard.

Parallel Device

The laptop is ready to use a parallel device such as a printer for output. A parallel printer or other parallel device has a Centronics compatible parallel interface. To use a parallel device you should connect it to the parallel connector on the back side of the laptop as shown in Figure 6-3.

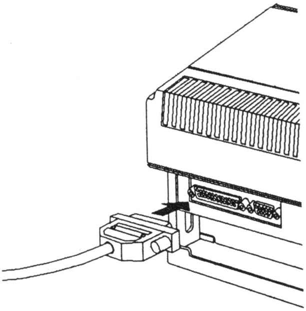


Figure 6-3. Connecting a printer or other parallel device to the laptop.

Serial Device

You can use a serial device for input and/or output if it has an RS-232 compatible serial interface. Serial printers, digitizers, and modems are all serial devices that connect to one of the two serial connectors, COM 1 or COM 2. The DB-9 COM 1 connector on the laptop is different than a DB-25 type on some serial devices. To plug a DB-25 connector into the COM 1 connector, you need a serial 25-to-9 adapter. To plug a serial device into the COM 2 connector, you may need to use the special COM 2 cable supplied with the laptop. Check your serial device's connector to determine your adapter needs. See Figures 6-4 and 6-5 below for connecting a serial device to the COM 1 or COM 2 ports.

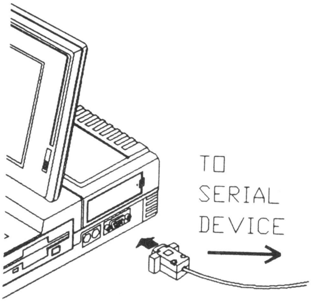


Figure 6-4. Inserting a serial device connector into the COM 1 port.

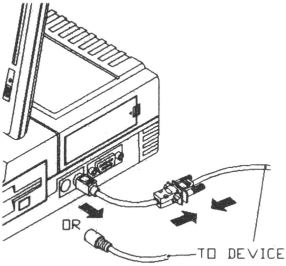


Figure 6-5. Inserting a serial device connector into the COM 2 port with or without the special COM 2 adapter.

On-Board Expansion Memory

The laptop comes standard with one megabyte of on-board memory. You may expand the on-board memory to two megabytes or a maximum of five megabytes by installing one of two available memory expansion cards: a one megabyte or a four megabyte card.

Carry out the following few steps to upgrade the on-board memory on your laptop to either two or five megabytes. Since this procedure requires extensive disassembly of the laptop, you should pay particular attention to how everything is placed or connected before disassembling. Before beginning to upgrade your on-board memory, make sure you have the following:

- A good work area
- Adequate time to complete the expansion in one session
- A Phillips screw driver
- A one or four megabyte expansion memory card. See Figure 6-6 below for drawings of the two on-board memory expansion cards

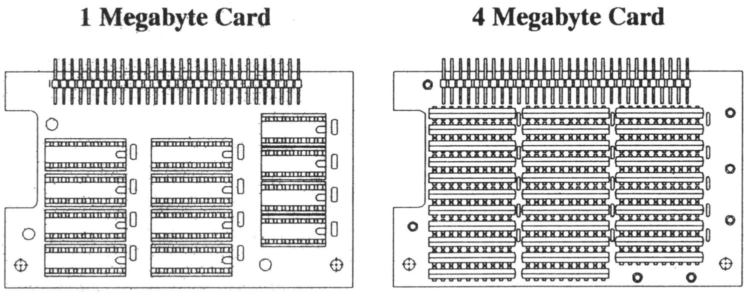


Figure 6-6. Available on-board memory expansion cards for the LA-30A laptop computer.

1. Disable the hard disk by pressing the hard disk button. The hard disk indicator should be off. If the indicator is still on, press the button again. This step is for the safety of your hard disk. When moving the laptop, it is possible to accidentally press the power switch at the back of the unit. If the hard disk is enabled and the power is accidentally turned on, the disk will begin to operate even if the laptop is upside down. This is not something you want to do to your hard disk.

2. Turn the power to the laptop off and disconnect all cables, including the power supply cable.

3. Use a Phillips screw-driver to remove the three screws securing the rear cover. To do so you will need to place the laptop in one of the two following positions:

   a. Position the carrying handle in its elevating position, then place the rear of the laptop near the edge of a table or desk. See Figure 6-7 below:

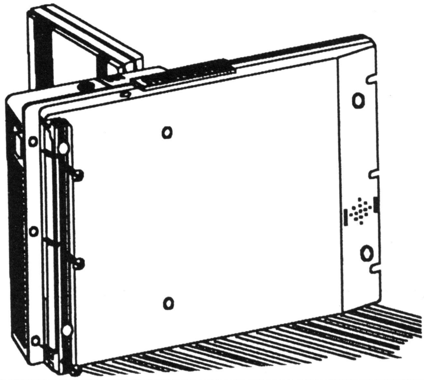


Figure 6-7. Removing the rear cover screws: Position 1

   b. Position the carrying handle in its elevating position, open the LCD screen, and tilt the laptop on its side as in Figure 6-8 below.

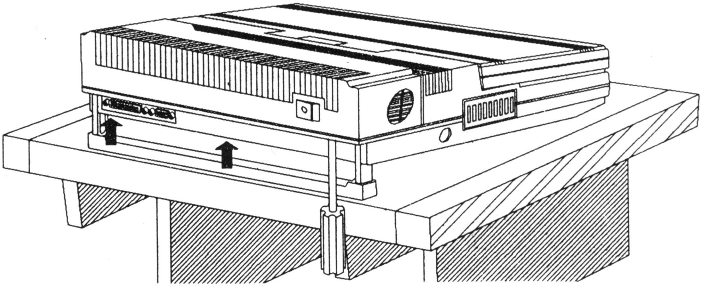


Figure 6-8. Removing the rear cover screws: Position 2.

4. Set the laptop back in its regular position and remove the rear cover as shown in Figure 6-9. You may need to first remove the option board access panel before removing the cover.

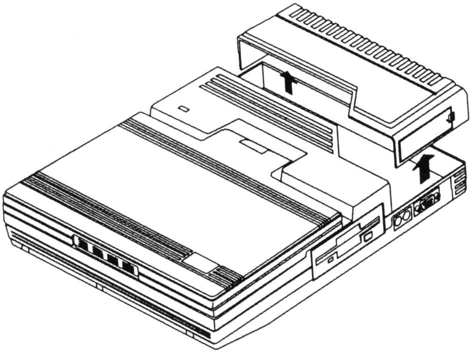


Figure 6-9. Removing the rear cover.

5. Refer to Figure 6-10 to disconnect (1) the LED/LCD cable, (2) the EL power cable, and (3) the power indicator cable. Disconnect the cables at the points indicated by the lines. When re-inserting these cables later, make sure they are inserted in the same position.

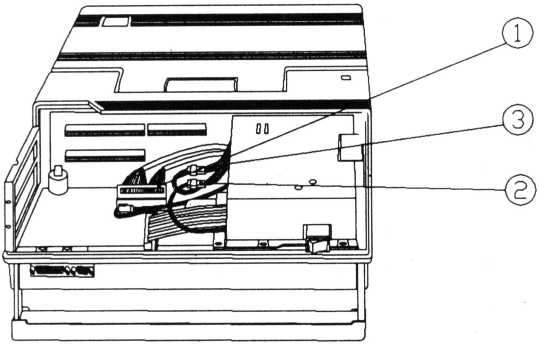


Figure 6-10. On-board memory installation: Disconnecting internal cables.

6. Reset the laptop on its side and remove the five screws on the bottom that hold the laptop's upper cover in place. See Figure 6-11. The screw directly under the space bar is shorter than the others. When re-inserting this screw, be sure to insert it in the same position. If you insert a long screw in its place, it will damage the upper cover.

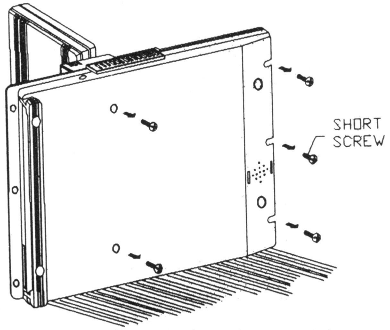


Figure 6-11. On-board memory installation: Removing bottom screws that secure the laptop's upper cover.

7. Reset the laptop back in its normal position. Lift the function key I.D. label from the laptop upper cover. Use a Phillips screw driver to remove the three screws that still secure the upper cover. See Figure 6-12 below.

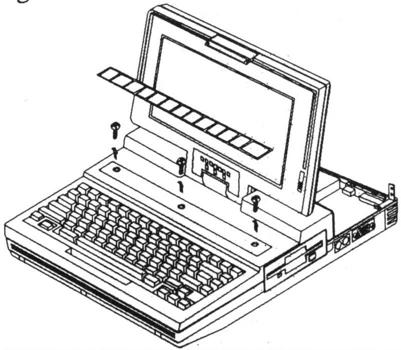


Figure 6-12. On-board memory installation: Removing upper screws that secure the laptop's upper cover.

8. On both the left and right sides of the upper cover positioned just in front of the floppy and hard disk drives are two hidden clips that hold the upper cover more securely to the bottom casing. Before you can remove the upper cover in the next step, you must release these clips. To release these clips, **firmly** press at the point shown in Figure 6-13 below and lift slightly . Once you release one side, the other side can be freed much more easily. Just lift the released side and the other side will free.

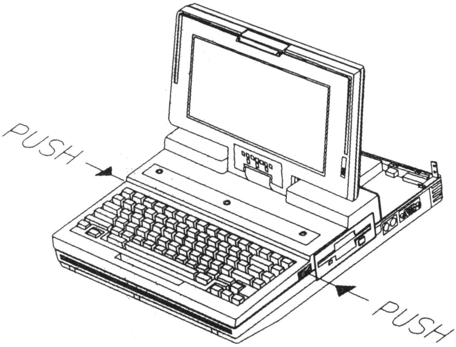


Figure 6-13. On-board memory installation: Releasing clips securing the upper cover.

9. Remove the upper cover and the LCD panel as in Figure 6-14 by lifting them from the rest of the laptop. Set the upper cover aside after removal.

WARNING:

Trying to lift the upper cover without first properly releasing the clips as describe above could break the plastic molding of the upper cover.

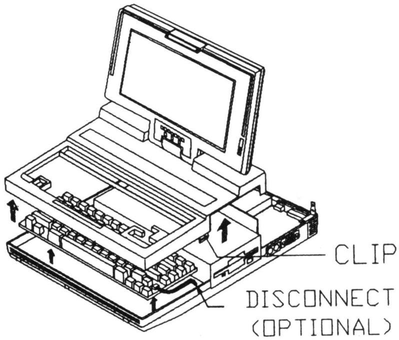


Figure 6-14. On-board memory installation: Removing the upper cover and the keyboard.

NOTE:

> Before removing the keyboard in the next step, look closely at how it is placed. The top edge of the keyboard, just above the function keys, slides into a groove on the side of the hard disk/floppy drive casing. Later when re-assembling the laptop, you should make sure the keyboard is replaced in the same position.

10. Lift the keyboard as in Figure 6-14 above to expose the memory expansion area of the main board. Place the keyboard aside, leaving the keyboard cable connected. If you wish, the cable can be disconnected, but is not necessary.

11. Remove screws as in Figure 6-15 below.

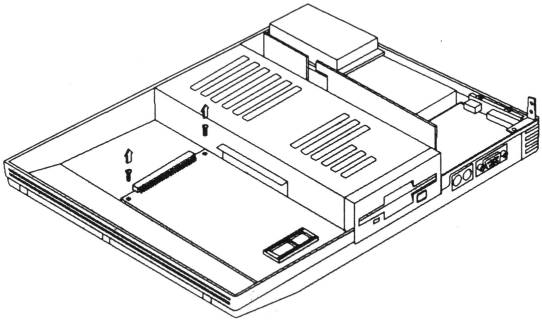


Figure 6-15. On-board memory installation: Removing screws at the memory expansion area.

12. Connect the memory expansion card (one or four megabyte card) to the expansion memory connector. See Figure 6-16.

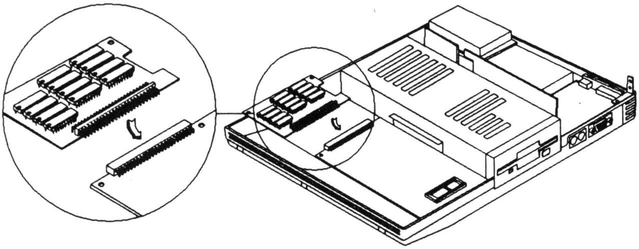


Figure 6-16. On-board memory installation: Connecting a memory expansion card to the main board.

13. Insert screws as in Figure 6-17 below.

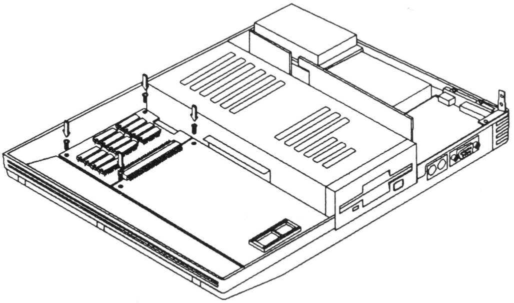


Figure 6-17. On-board memory installation: Securing a memory expansion board to the bottom casing and main board.

When memory installation is complete, backtrack steps nine through three to re-assemble the laptop. One special note about re-assembly should be noted here:

IMPORTANT NOTE:

> When re-inserting the screws at various places on the laptop, make sure you do not apply any more torque (pressure) than necessary. The threads or sockets that the screws insert into can be stripped quite easily.

Finally, power-on the laptop and press <F1> if you receive a "CMOS memory size mismatch" message. Refer to Chapter 4 for CMOS setup explanations.

If the laptop does not recognize the newly installed expansion memory even after running the CMOS setup, you'll need to run the NEAT setup as described in Chapter 5, read the appropriate standard configuration file from disk, and select POWER ON RESET at the NEAT main menu. You may then need to run the CMOS setup again. Once the laptop recognizes the memory, you can continue to use the SETNEAT3 program to configure your memory as desired, also fully explained in Chapter 5.

Numeric Processor

The LA-30A laptop comes standard with a numeric processor socket on the main board but without the processor. You may insert into this socket an 80287-8 numeric processor to speed up the laptop's numeric calculations. Since this procedure requires extensive disassembly of the laptop, you should pay particular attention to how everything is placed or connected before removing.

Before beginning, make sure you have the following:

- A good work area
- Adequate time to complete the expansion in one session
- A Phillips screw driver
- An Intel 80287-8 numeric processor

1. Disable the hard disk by pressing the hard disk button. The hard disk indicator should be off. If the indicator is still on, press the button again. This step is for the safety of your hard disk. When moving the laptop, it is possible to accidentally press the power switch at the back of the unit. If the hard disk is enabled and the power is accidentally turned on, the disk will begin to operate even if the laptop is upside down. This is not something you want to do to your hard disk.

2. Turn the power to the laptop off and disconnect all cables, including the power supply cable.

3. Use a Phillips screw-driver to remove the three screws securing the rear cover. To do so you will need to place the laptop in one of the two following positions:

   a. Position the carrying handle in its elevating position, then place the rear of the laptop near the edge of a table or desk. See Figure 6-18 below:

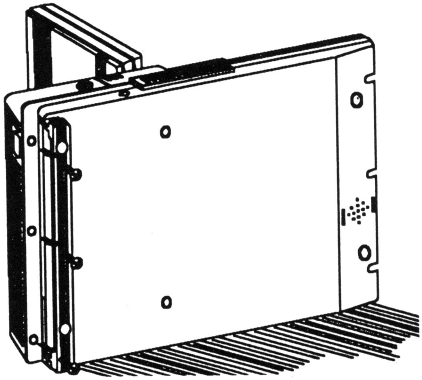


Figure 6-18. Numeric processor installation: Removing the rear cover screws: Position 1

b. Position the carrying handle in its elevating position, open the LCD screen, and tilt the laptop on its side as in Figure 6-19 below.

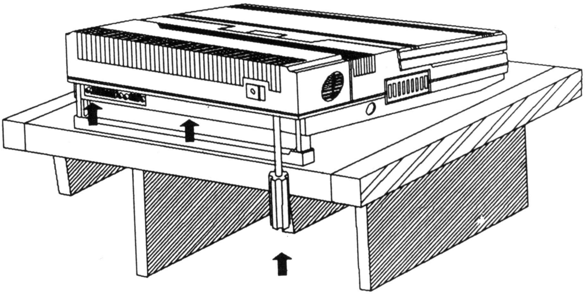


Figure 6-19. Numeric processor installation: Removing the rear cover screws: Position 2.

4. Set the laptop back in its regular position and remove the rear cover as shown in Figure 6-20 below. You may need to first remove the option board access panel before removing the cover.

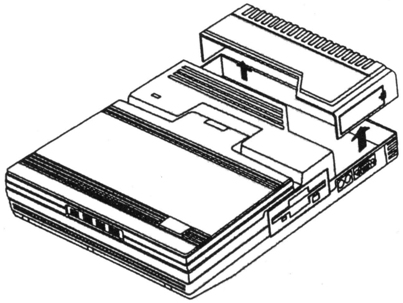


Figure 6-20. Numeric processor installation: Removing the rear cover.

5. Refer to Figure 6-21 below to disconnect (1) the LED/LCD cable, (2) the EL power cable, and (3) the power indicator cable. Disconnect the cables at the points indicated by the lines. When re-inserting these cables later, make sure they are inserted in the same position.

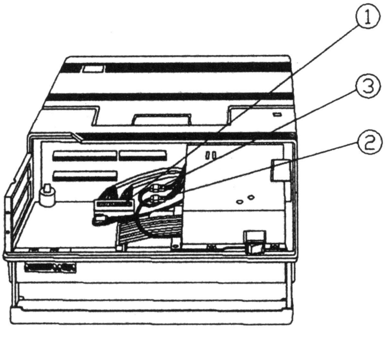


Figure 6-21. Numeric processor installation: Disconnecting internal cables.

6. Reset the laptop on its side and remove the five screws on the bottom that hold the laptop's upper cover in place. See Figure 6-22. The screw directly under the space bar is shorter than the others. When re-inserting this screw, be sure to insert it in the same position. If you insert a long screw in its place, it will damage the upper cover.

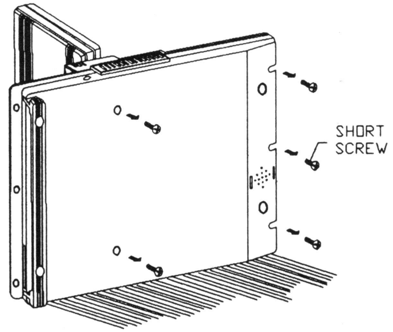


Figure 6-22. Numeric processor installation: Removing screws that secure the laptop's upper cover.

7. Reset the laptop back in its normal position. Lift the function key I.D. label from the laptop to expose three screws that still secure the upper cover; use your screw-driver to remove these. See Figure 6-23 below.

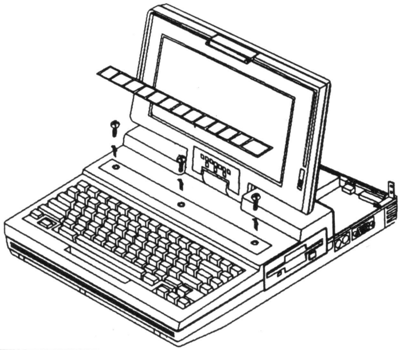


Figure 6-23. Numeric processor installation: Removing upper screws that secure the laptop's upper cover.

8. On both the left and right sides of the upper cover positioned just in front of the floppy and hard disk drives are two hidden clips that hold the upper cover more securely to the bottom casing. Before you can remove the upper cover in the next step, you must release these clips. To release these clips, **firmly** press at the point shown in Figure 6-24 below and lift slightly . Once you release one side, the other side can be freed much more easily. Just lift the released side and the other side will free.

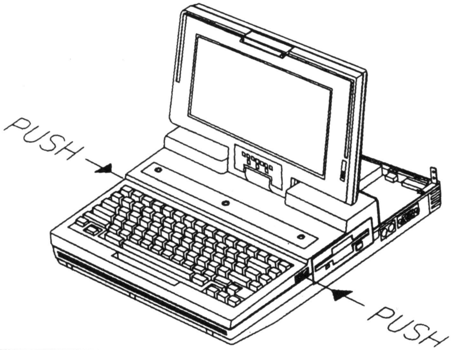


Figure 6-24. Numeric processor installation: Releasing clips securing the upper cover.

9. Remove the upper cover and the LCD panel as in Figure 6-25 by lifting them from the rest of the laptop. Set the upper cover aside after removal.

WARNING:

Trying to lift the upper cover without first properly releasing the clips as describe above could break the plastic molding of the upper cover.

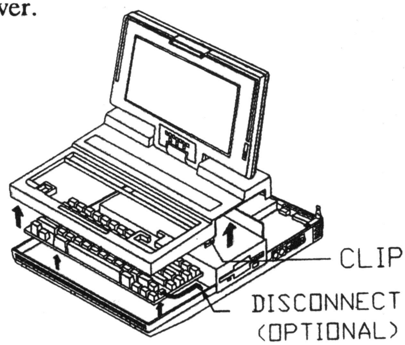


Figure 6-25. Numeric processor installation: Removing the upper cover and the keyboard.

NOTE:

Before removing the keyboard in the next step, look closely at how it is placed. The top edge of the keyboard, just above the function keys, slides into a groove on the side of the hard disk/floppy drive casing. Later when re-assembling the laptop, you should make sure the keyboard is replaced in the same position.

10. Lift the keyboard as in Figure 6-25 above to expose the numeric processor socket on the main board. Place the keyboard aside, leaving the keyboard cable connected. If you wish, the cable can be disconnected, but is not necessary.

11. Removing the keyboard exposes the built-in numeric processor socket. Notice the notch at the front end of the socket. This is called the index area. The processor should be inserted with *its* index area facing toward the front, just as the socket's index area. See Figure 6-26 below:

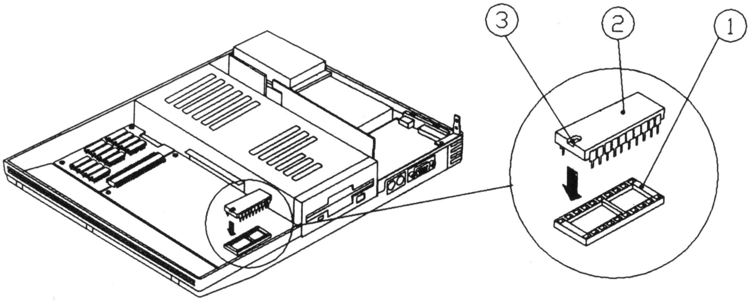


Figure 6-26. Numeric processor installation: (1) Numeric processor socket, (2) Numeric processor chip, and (3) Index area on processor chip.

When installation is complete, follow the preceding steps in reverse order to re-assemble the laptop. One special note about re-assembly should be noted here:

IMPORTANT NOTE:

When re-inserting the screws at various places on the laptop, make sure you do not apply any more torque (pressure) than necessary. The threads or sockets that the screws insert into can be stripped quite easily.

Option Boards

The LA-30A laptop is equipped with two expansion slots for adding option boards: one 8-bit IBM XT compatible bus, and one 16-bit IBM AT compatible bus. The option boards you add can be no longer than 2/3 length boards. To install an option board, follow the manufacturer's instructions for your particular expansion board, and also the steps listed below for inserting the expansion board in the LA-30A's expansion slots.

1. Disable the hard disk by pressing the hard disk button. The hard disk indicator should be off. If the indicator is still on, press the button again. This step is for the safety of your hard disk. When moving the laptop, it is possible to accidentally press the power switch at the back of the unit. If the hard disk is enabled and the power is accidentally turned on, the disk will begin to operate even if the laptop is upside down. This is not something you want to do to your hard disk.

2. Turn the power to the laptop off and disconnect all cables, including the power supply cable.

3. Use a Phillips screw-driver to remove the three screws securing the rear cover. To do so you will need to place the laptop in one of the two following positions:

    a. Position the carrying handle in its elevating position, then place the rear of the laptop near the edge of a table or desk. See Figure 6-27 below:

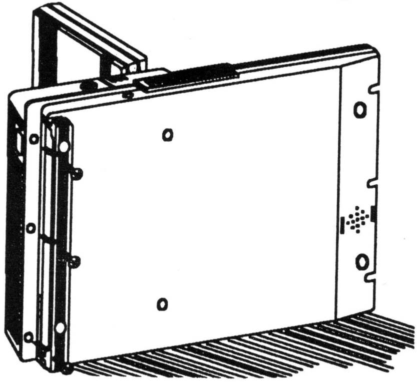


Figure 6-27. Option board installation: Removing the rear cover screws: Position 1.

b. Position the carrying handle in its elevating position, open the LCD screen, and tilt the laptop on its side as in Figure 6-28 below.

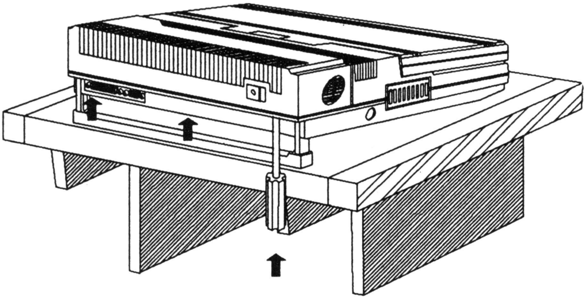


Figure 6-28. Option board installation: Removing the rear cover screws: Position 2.

4. Set the laptop back in its regular position and remove the rear cover as shown in Figure 6-29. You may need to first remove the option board access panel before removing the cover.

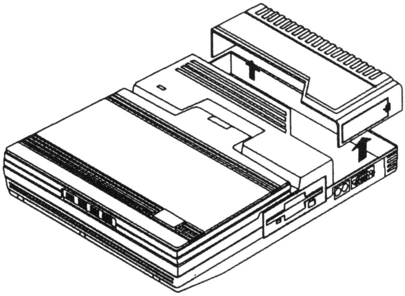


Figure 6-29. Option board installation: Removing the rear cover.

5. Once the rear cover has been removed, you can clearly see the expansion slots. The lower short slot is the 8-bit XT slot, and the upper is the 16-bit AT slot. Next, slide the expansion board's connector into the appropriate slot. See Figure 6-30 below:

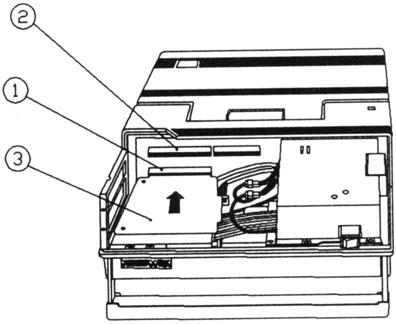


Figure 6-30. Option board installation: (1) XT expansion slot, (2) AT expansion slot, and (3) Option board.

6. To complete the installation, secure the option board to the laptop by inserting a screw as in Figure 6-31 below:

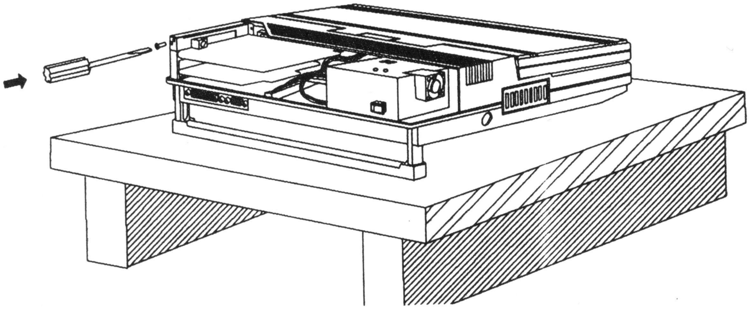
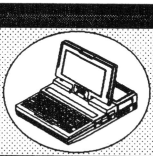


Figure 6-31. Option board installation: Securing the option board to the laptop.

After securing the option board, you may want to turn on the laptop and test the operation of the expansion board before replacing the rear cover. If there are no problems, turn the laptop off and complete installation by replacing the rear cover and re-inserting the cover screws. Refer to the manufacturer's instructions for any questions about the option board you're installing.

CHAPTER 7

Solving Problems



This chapter is provided should you ever have a problem with the LA-30A laptop and need special help. Many times problems are due to our own oversight, like forgetting to turn the hard disk on when it should be on, or setting the wrong screen mode for a certain kind of software. Sometimes a problem is software related; maybe you didn't supply it accurate information during the program's setup to run correctly on the laptop. If you have an unsolvable problem, check the section in this chapter on general problems. If the laptop supplies an error message, check the section on error messages.

When a problem does occur, pay careful attention to the laptop. Any sound, message, or indicator may indicate its source. Some problems may be solved easily by following the instructions in this chapter; others may not be so obvious. If the problem is not mentioned in this manual, call your dealer or service center for help.

General Problems

1. No messages during power–on.

Problem	Possible Solution
a. Improper contrast	Adjust the contrast.
b. Low battery voltage	Use the AC adapter.
c. AC power failure	Check the electrical outlet and connections.

2. Garbage on the screen and ticks during power-on.

	Problem	Possible Solution
a.	Low battery level	Use the AC adapter.

3. Beeps from the speaker for a few seconds during power-on.

	Problem	Possible Solution
a.	Low battery level	Use the AC adapter.

4. The Battery Low indicator remains on.

	Problem	Possible Solution
a.	AC power failure	Check the electrical outlet and connections.

5. The Caps Lock and Num Lock indicators remain on during power-on.

	Problem	Possible Solution
a.	Reset failure	Restart your laptop.
b.	Low battery level	Use the AC adapter.

6. The floppy disk drive indicator remains on after a self-test.

	Problem	Possible Solution
a.	Wrong diskette	Try the diskette that came with your laptop.
b.	Defective diskette	Try another backup copy of the DOS diskette.

Error Messages

When the laptop detects an error, it may display a brief message related to the error on the screen, sometimes accompanied by a short beep. You should pay attention to the message and write it down on the Problem Detail Report. For your reference, a list of error messages with explanations and suggestions is provided below.

1. "Keyboard error" or "Keyboard/Interface error" during power-on.

	Problem	Possible Solution
a.	Depressed keys	Release the depressed keys.
b.	Reset failure	Restart your laptop.

2. "CMOS ...." during power-on.

	Problem	Possible Solution
a.	Low battery level	Use the AC adapter and run the CMOS setup.
b.	Improper settings	Run the CMOS setup.

3. "Floppy error" during power-on.

	Problem	Possible Solution
a.	Improper insertion	Re-insert the diskette again.
b.	Defective diskette	Try another backup copy of the DOS diskette.

4. "DRIVE NOT READY ERROR
Insert BOOT diskette in drive A:
Press any key when ready ......" during power-on.

	Problem	Possible Solution
a.	Missing diskette	Insert a bootable diskette in drive A:.
b.	Improper insertion	Remove and insert the diskette again.
c.	Defective diskette	Try another backup copy of the DOS diskette.

5. "Diskette failure" or "Invalid diskette" during power-on.

	Problem	Possible Solution
a.	Improper insertion	Remove and insert the diskette again.
b.	Defective diskette	Try another bootable diskette.
c.	Not a bootable diskette	Try a bootable disk.

6. "Non-System disk or disk error
Replace and strike any key when ready" during power-on.

	Problem	Possible Solution
a.	Non-System diskette	Replace with a bootable diskette.
b.	Defective diskette	Try another bootable diskette.

7. "Bad or Missing Command Interpreter" during power-on.

	Problem	Possible Solution
a.	COMMAND.COM missing	Try a DOS diskette with the COMMAND.COM file.

If error messages appear on the screen other than what is mentioned here, first check the list of messages in the *Microsoft MS-DOS User's Reference*. If the error message appears while you are using an application program like a word processor or a data base, check that program's reference manual for a list of error messages. If after checking this and other reference manuals you cannot solve the problem, record the problem on a copy of the Problem Detail Report and call your dealer or service center for help.

How to Get Service

If your laptop needs service, take or ship it to an authorized service center for repair, or call the dealer who sold you the laptop.

We suggest that you make an enlarged photocopy of the Problem Detail Report, complete it, and attach it to the laptop before delivering it to the service center. For your own reference, you should make a copy of the completed form.

For the sake of convenience later on, jot down on page vi of this manual the name and phone number of the person to contact for service.

LA-30A Problem Detail Report

User's Name______________________________ Tel.__________

Address____

Serial No.________________ BIOS Ref. No.________________

Purchase Date____

Place of Purchase_______________________________________

Address____

____

Tel.____

Circle the number or letter that best describes your problem and complete any requested information.

1. Out of order. Since when?______________________________
2. Unstable. Since when?________________________________
3. The laptop worked before, but hasn't worked since it
   a. Was moved. When moved?__________________________
   b. Was connected with a power adapter.

      When connected?_______________________________

      Type of power adapter?____________________________

c. Was connected with a peripheral____________________

Type of peripheral______________________________

Model____

d. Ran a certain program.

Program name and version________________________

Usage____

Vendor_______________________________________

4. The laptop works most of the time, but fails when it runs a certain program or group of programs. If there is more than one program, record the information in the available space at the end of this report.

Program name and version___________________________

Program usage____________________________________

Vendor____

Please record below the command or series of commands (in exact order) that fail to execute as expected or which cause some problem with the laptop. Then record any error messages you receive.

Error messages:

List below the contents of the CONFIG.SYS file and the name of any resident programs present.

____

____

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Use the space below if you need additional room.

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APPENDIX A

Specifications

General Specifications

Dimensions		
Length	324 mm	12.76 in
Depth	409 mm	16.1 in
Height	80 mm	3.15 in
Weight		
System	6.7 kg	14.77 lbs
Max. Power Consumption		
	HDD on	42 W
	HDD idle	31 W
	HDD off	29 W
Environment		
Operating temperature	4°C - 36°C	39°F - 97°F
Storage temperature	-10°C - 49°C	14°F - 120°F
Acceptable hum. level	Operation:	20% - 80%
	Storage:	10% - 80%

AC Adapter

Input	AC, 90 to 260 Volts 47 to 63 Hz 72 W
Output	DC, 17 Volts 3.2 amps

20 MB Hard Disk Specs

Product Name and Model Number	**Conner CP3024**

Physical Characteristics

Actuator Type	Rotary Voice-Coil
Number of Disks	1
Data Surfaces	2
Data Heads	2
Servo	Embedded
Tracks per Surface	636
Track Density	1150 TPI
Track Capacity	Formatted: 16,896 Bytes
Bytes per Block	512
Blocks per Drive	41,976
Sectors per Track	34 physical; 33 user

Performance

Seek Times[*]	Track to Track: 8 ms Average: 27 ms [**] Maximum: 50 ms	
Average Latency	8.4 ms	
Rotation Speed (±0.1%)	3575 RPM	
Controller Overhead	1 ms	
Data Transfer Rate		
To/from media	1.25 MB/sec.	
To/from buffer	4.5 MB/sec.	
Start Time (Power Up)		
0 RPM - 3575 RPM	Typical:	5 seconds
	Maximum:	10 seconds
0 RPM - READY	Typical:	7 seconds
	Maximum:	15 seconds
Stop Time (Power Down)	Typical:	5 seconds
	Maximum:	10 seconds
Start/Stop Cycles	10,000 min.	
Interleave	1:1	
Buffer Size	8KB	

[*] At nominal D.C. input voltages.

[**] Average seek time is determined by dividing the total time required to seek between all possible ordered pairs of track addresses by the total number of these ordered pairs.

Environmental Characteristics

Temperature	
Operating	5°C to 55°C
Non-Operating	-40°C to 60°C
Thermal Gradient	20°C per hour maximum
Humidity	
Operating	8% to 80 % non-condensing
Non-Operating	8% to 80 % non-condensing
Maximum Wet Bulb	26°C
Altitude (Relative to sea level)	
Operating	-200 to 10,000 feet
Non-operating (maximum)	40,000 feet

Shock and Vibration

Shock (1/2 sine pulse)
Vibration (Swept sine, 1 octave per minute)
Measured without shock isolation.

Non-operating shock	75 G's, 11 ms (without non-recoverable errors
Non-operating vibration	
5-62 Hz	0.020" double amplitude
63-500 Hz	4 G's 0-peak
Operating shock	5 G's, 11 ms (without non-recoverable errors)
Operating vibration	
5-27 Hz	0.010" double amplitude
28-500 Hz	0.5 G's 0-peak (without non-recoverable errors

40 MB Hard Disk Specs

Product Name and Model Number	**Conner CP3044**

Physical Characteristics

Actuator Type	Rotary Voice-Coil
Number of Disks	1
Data Surfaces	2
Data Heads	2
Servo	Embedded
Tracks per Surface	1047
Track Density	1400 TPI
Track Capacity	Formatted: 20,480 Bytes
Bytes per Block	512
Blocks per Drive	83,760
Sectors per Track	41 physical; 40 user

Performance

Seek Times*	Track to Track: 8 ms	
	Average: 25 ms **	
	Maximum: 50 ms	
Average Latency	8.4 ms	
Rotation Speed (±0.1%)	3557 RPM	
Controller Overhead	1 ms	
Data Transfer Rate		
To/from media	1.5 MB/sec.	
To/from buffer	4 MB/sec.	
Start Time (Power Up)		
0 RPM - 3557 RPM	Typical:	5 seconds
	Maximum:	10 seconds
0 RPM - READY	Typical:	7 seconds
	Maximum:	15 seconds

Performance (Continued)

Stop Time (Power Down)	Typical:	5 seconds
	Maximum:	10 seconds
Start/Stop Cycles	10,000 min.	
Interleave	1:1	
Buffer Size	8KB	

* At nominal D.C. input voltages.

** Average seek time is determined by dividing the total time required to seek between all possible ordered pairs of track addresses by the total number of these ordered pairs.

Environmental Characteristics

Temperature	
Operating	5°C to 55°C
Non-Operating	-40°C to 60°C
Thermal Gradient	20°C per hour maximum
Humidity	
Operating	8% to 80 % non-condensing
Non-Operating	8% to 80 % non-condensing
Maximum Wet Bulb	26°C
Altitude (Relative to sea level)	
Operating	-200 to 10,000 feet
Non-operating (maximum)	40,000 feet

Shock and Vibration

Shock (1/2 sine pulse)
Vibration (Swept sine, 1 octave per minute)
Measured without shock isolation.

Non-operating shock	75 G's, 11 ms (without non-recoverable errors
Non-operating vibration	
5-62 Hz	0.020" double amplitude
63-500 Hz	4 G's 0-peak
Operating shock	5 G's, 11 ms (without non-recoverable errors)
Operating vibration	
5-27 Hz	0.010" double amplitude
28-500 Hz	0.5 G's 0-peak (without non-recoverable errors

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